ANNUAL REPORT

WATERMASTER SERVICE IN THE UPPER LOS ANGELES RIVER AREA (ULARA) LOS ANGELES COUNTY, CALIFORNIA

Re: City of Los Angeles vs. City of San Fernando, et al.
Superior Court Case No. 650079 - County Of Los Angeles

2017-18 WATER YEAR
OCTOBER 1, 2017 - SEPTEMBER 30, 2018

December 2019

ULARA

UPPER LOS ANGELES RIVER AREA WATERMASTER

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IN THE
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LOS ANGELES COUNTY, CALIFORNIA

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ULARA WATERMASTER
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December 2019

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FOREWORD

As Watermaster for the Court-adjudicated Upper Los Angeles River Area (ULARA), I am pleased to present the Annual Watermaster Report for Water Year (WY) 2017-18 (i.e., from October 1, 2017 through September 30, 2018). Please note that this Annual Watermaster Report is being submitted to the Court later than its anticipated May 2019 filing date. Due to the delayed receipt of data necessary for analysis, reporting, and timely finalization of the report, this current Annual Watermaster Report is being provided to the Court in December 2020. However, to avoid confusion with the submittal to the Court of forthcoming Annual Watermaster Report for WY 2018-19, this current report has been purposely dated December 2019. This report has been prepared by Watermaster staff and myself in general accordance with the provisions of the Final ULARA Judgment, dated January 26, 1979, in regard to the Court-defined water rights case of the Superior Court for the County of Los Angeles (i.e., *City of Los Angeles vs. City of San Fernando, et al, Case No. 650079*).

Described in this Annual Watermaster Report are the water rights of each Party in each of the four ULARA groundwater basins, along with the volume of groundwater in storage to the credit of each Party, as of October 1, 2018. Four distinct groundwater basins and their adjoining hill and mountain watershed areas comprise ULARA. From largest to smallest in surface area, these four groundwater basins are known as the San Fernando, Sylmar, Verdugo and Eagle Rock basins. Also provided herein for each of the four ULARA groundwater basins are basin-specific data regarding their respective boundaries, local geologic conditions, local water supply, groundwater extractions, changes in groundwater levels over time, estimated change in groundwater in storage, imported water use, recharge operations, and water quality for the current 2017-18 WY.

Annual precipitation in ULARA in WY 2017-18 was below average. Despite the reduced rainfall in the region, surface water deliveries to ULARA from the Los Angeles Aqueduct (LAA) were slightly higher than those in WY 2016-17. The 2017-18 WY marks the second consecutive WY that has seen groundwater extractions in the San Fernando Basin fall far below the long-term average annual groundwater extractions for this basin, and the third-lowest year on record since WY 1968-69. The reduced groundwater production volume in WY 2017-18 is attributable primarily to reductions in pumping by LADWP in response to groundwater contamination mainly in the eastern portion of San Fernando Basin. Key current challenges in ULARA continue to be: the accumulation of stored water credits in the San Fernando Basin; new and/or ongoing problems with contamination of groundwater

in the San Fernando, Verdugo and Sylmar basins; the need to remediate that groundwater contamination; the apparent ongoing decline in groundwater levels in Verdugo Basin; and the need to increase recharge into the local groundwater basins. This need for increased recharge is particularly important for the San Fernando Basin.

In late-2007, the cities of Burbank, Glendale, and Los Angeles entered into a 10-year agreement which was oriented to help reverse the long-term decline of groundwater in storage and the concurrent accumulation of a large quantity of unsupported stored water credits in the San Fernando Basin. That agreement, which yielded significant work by the Parties to increase groundwater recharge in the San Fernando Basin, expired in December 2017. Regardless, the Parties continue to advance planning efforts and projects to help increase groundwater recharge in certain ULARA basins.

Groundwater contamination from volatile organic compounds (VOCs), hexavalent chromium (CrVI), and some other newly-emerging contaminants continues to be a serious problem for water-supply in ULARA, but particularly in the eastern portion of the San Fernando Basin. The cities of Burbank, Glendale, and Los Angeles continue to enlist the assistance of key regulatory agencies including the United States Environmental Protection Agency (USEPA), the California Department of Toxic Substances Control (DTSC) and the Regional Water Quality Control Board – Los Angeles (RWQCB-LA) to help further characterize and expedite the cleanup of the contaminated soils and groundwater within the San Fernando Basin. Pumping of excessive concentrations of CrVI by certain municipal-supply wells and the current limitations of existing treatment facilities to treat those excessive concentrations continue to be problems in San Fernando Basin.

In the Sylmar Basin, nitrate concentrations have been increasing in recent years in certain water-supply wells operated by the City of San Fernando. The City of Los Angeles has wells that have been impacted by trichloroethylene (TCE) in this same basin. A number of other municipal-supply water wells have had to be removed from active service due to excessive concentrations of various contaminants in the Sylmar and Verdugo Basins, but these problems are greater and more widespread in San Fernando Basin.

To provide ongoing groundwater management within the four ULARA groundwater basins, the Watermaster and the Administrative Committee (i.e., representatives from the Parties to the Judgment: the cities of Burbank, Glendale, Los Angeles, and San Fernando, and the Crescenta Valley Water District) continued to meet on a quarterly basis during the

current WY. The Watermaster also continued to provide updates on key ULARA issues at occasional status conferences with the Honorable Susan Bryant-Deason, Judge of the Los Angeles County Superior Court.

As noted in prior Annual Watermaster Reports, table numbers herein have been adjusted as needed, and are therefore different than those shown in reports issued for WY 2014-15 and earlier. However, the formats of the tables have generally remained consistent to allow for comparison of year-to year changes in specific values.

In accordance with the provisions of the California Sustainable Groundwater Management Act (SGMA), the Watermaster has continued to upload the required information from the Annual ULARA Watermaster reports to the SGMA Adjudicated Basins Reporting website. Summary Table 1-3 in this report is specifically formatted to include the information that is reported on the SGMA website and shows how those values are collected using the data presented in the Annual Watermaster Report. The Watermaster also continues to attend California Department of Water Resources (DWR) workshops related to SGMA Adjudicated Basin reporting and has worked directly with DWR personnel on various issues on an as-needed basis.

For this Annual Watermaster Report, I want to acknowledge and personally thank the Watermaster Support Staff at LADWP for their continued efforts in creating many of the data tables, figures, and maps, as well as for conducting computer model simulations that continue to be vital to the preparation and submittal of this report to the Court. Among those at LADWP whose efforts continue to be particularly notable are Mr. Scott Hungerford, Ms. Fatema Akhter, Mr. Hadi Jonny, Mr. Manuel Aguilar, and Mr. Rafael Villegas. I also want to thank the Assistant Watermaster, Mr. Anthony Hicke, for his ongoing efforts in preparing this report and participating in the quarterly meetings with the ULARA Administrative Committee.

Respectfully submitted

Richard C. Slade, ULARA Watermaster

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TABLE OF CONTENTS

TABLES

FIGURES

PLATES

APPENDICES

KEY ABBREVIATIONS

AF	Acre-feet
AFY	Acre-feet per Year
BOU	Burbank Operable Unit
BTEX	Benzene, Toluene, Ethylbenzene, and Total Xylene
CVWD	Crescenta Valley Water District
Cal-EPA	California Environmental Protection Agency
CrT	Total chromium
CrVI	Hexavalent chromium
DCA	Dichloroethane
DCE	Dichloroethylene
DDW	California Division of Drinking Water, within the SWRCB
DTSC	California Department of Toxic Substances Control
EIR	Environmental Impact Report
ERB	Eagle Rock Basin
EPA	Environmental Protection Agency (see also USEPA)
GAC	Granular Activated Carbon
GCOU	Glendale Chromium Operable Unit
GOU	Glendale Operable Unit
GNOU	Glendale North Operable Unit
GSE	Ground Surface Elevation
GSOU	Glendale South Operable Unit
gpm	Gallons Per Minute
LAA	Los Angeles Aqueduct
LABOE	Los Angeles Bureau of Engineering
LACDPW	Los Angeles County Department of Public Works
LADWP	Los Angeles Department of Water and Power
LAFD	Los Angeles Fire Department
LASAN	Los Angeles Bureau of Sanitation
LID	Low Impact Development (formerly known as SUSMP)
MCL	Maximum Contaminant Level
mg/L	Milligrams per Liter, same as parts per million
MTA	Metropolitan Transportation Authority
MWD	Metropolitan Water District of Southern California
NCP	National Contingency Plan
NHOU	North Hollywood Operable Unit
OEHHA	Office of Environmental Health Hazard Assessment
OU	Operable Unit
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene (Tetrachloroethylene, Perchloroethylene)
PFAS	Per- and polyfluoroalkyl substances
PHG	Public Health Goal
ppb	Parts per billion, same as micrograms per liter
ppm	Parts per million, same as milligrams per liter
PRP	Potentially responsible party
PSDS	Private Sewage Disposal Systems
RAP	Remedial Action Plan
RI	Remedial Investigation
RWQCB	Regional Water Quality Control Board

SGMA	Sustainable Groundwater Management Act
SFB	San Fernando Basin
SWRCB	State Water Resources Control Board
SWAT	Solid Waste Assessment Test
TCA	1,1,1-Trichloroethane
TCE	Trichloroethene (Trichloroethylene)
TCP	1,2,3-Trichloropropane
TDS	Total Dissolved Solids
TSG	Tujunga Spreading Grounds
µg/L	Micrograms per Liter, same as parts per billion
ULARA	Upper Los Angeles River Area
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	Volatile Organic Compound
VPWTP	Glendale-Verdugo Park Water Treatment Plant
WRP	Water Reclamation Plant
WY	Water Year (Oct 1 of one year through Sept 30 of the following year)

WATER EQUIVALENTS

Volume

1 gallon (gal)*	= 3.7854 liters (L)	= 231** cubic inches (in^3)
	= 0.0037854 cubic meters (m^3)	= 0.13368 cubic feet (ft^3)
100 cubic feet (HCF)***	= 748.05 gallons (gal)	= 2.8317 cubic meters (m^3)
	= 2,831.7 liters (L)	= 3.7037 cubic yards (yd^3)
	= 6,236.6 pounds (lb) (fresh water at 60°F)	= 2,828.9 kilograms (kg) (fresh water at 60°F)
1 acre-foot (AF)****	= 43,560** cubic feet (ft^3)	= 1,233.5 cubic meters (m^3)
	= 325,850 gallons (gal)	= 1,233,500 liters (L)
	= the approximate amount of water used by two families for one year.	

Flow

1 cubic foot per second (cfs)	= 448.83 gallons per minute (gpm)	= 0.028317 cubic meters/sec (m^3/s)
	= 646,320 gallons per day (gpd)	= 1.6990 cubic meters/min (m^3/min)
	= 1.9835 acre-feet/day (AF/day)	= 2,446.6 cubic meters/day (m^3/day)
1,000 gallons per minute (gpm)	= 2.2280 cubic feet per second (cfs)	= 0.063090 cubic meters/sec (m^3/s)
	= 4.4192 acre-feet/day (AF/day)	= 5,451.0 cubic meters/day (m^3/day)
	= 1,613.0 acre-feet/year (AFY)	= 1,989,600 cubic meters/year (m^3/yr)
1 million gallons per day (mgd)	= 3.0689 acre-feet/day (AF/day)	= 3,785.4 cubic meters/day (m^3/day)
	= 1,120.1 acre-feet/year (AFY)	= 1,381,700 cubic meters/yr (m^3/yr)

Concentration

1 milligram per liter (mg/L)	= 1 part per million (ppm)
1 milligram per liter (mg/L)	= 1,000 micrograms per liter (µg/L)
1 microgram per liter (µg/L)	= 1 part per billion (ppb)
1 part per million (ppm)	= 1,000 parts per billion (ppb)

* U.S. gallons

** Exact Value

*** HCF is a common billing unit used by municipal water purveyors.

**** An acre-foot of water covers one acre of land to a depth of one foot.

1 INTRODUCTION

1.1 BACKGROUND

The Court-adjudicated Upper Los Angeles River Area (ULARA) encompasses the entire hill and mountain watershed and the topographically-lower and intervening valley floor areas of the Los Angeles River and its tributaries upstream of (north of) a runoff gage in the river designated by the Los Angeles County Department of Public Works (LACDPW) as Gaging Station F-57C-R; this gage lies along the Los Angeles River, just north of the River's confluence with the Arroyo Seco (see Plate 1, "ULARA Location Map"). The entire ULARA region encompasses a total of approximately 328,500 acres of hill and mountain areas and intervening valley fill areas. Approximately 122,800 acres of the total ULARA area represent the valley fill areas that form the four groundwater basins, whereas the remaining 205,700 acres are comprised by the tributary hills and mountains in the watershed that surround these groundwater basins. ULARA is bordered on the north and northwest by the Santa Susana Mountains; on the north and northeast by the San Gabriel Mountains; on the east by the San Rafael Hills; on the west by the Simi Hills and Chatsworth Hills; and on the south by the Santa Monica Mountains.

Four distinct groundwater basins were defined within the valley fill areas by the ULARA Judgment of 1979; these include, from largest to smallest, the San Fernando, Sylmar, Verdugo and Eagle Rock basins (refer to Plate 1). The groundwater reservoir comprising each of these groundwater basins is essentially separated from the others. Each basin is considered to be replenished (recharged) by deep percolation from direct rainfall, infiltration of surface water runoff, and infiltration of excess irrigation of a portion of the water that is delivered for use within these basins. Artificial recharge is also practiced in spreading basins in the eastern portion of the San Fernando Basin via the use of excess rainfall and runoff when available, and also with imported water.

Within the four ULARA groundwater basins, the potentially water-bearing sediments are comprised by various young and old alluvial fan-type deposits. In the San Fernando and Sylmar basins, the potentially water-bearing sediments also include various strata that are assigned to the Saugus Formation. This formation is considered to underlie all geologically younger and older alluvial fan-type deposits within these two groundwater basins.

Exposed at ground surface in all of the topographically-elevated hill and mountain watershed areas of ULARA, and also known to directly underlie all potentially water-bearing sediments (including the Saugus Formation, where present) beneath the four ULARA groundwater basins, are geologically older sedimentary rocks (i.e., sedimentary bedrock) and even older crystalline, metamorphic and igneous rocks (i.e., crystalline basement rock). These geologically older rocks are either well-lithified, cemented, and/or crystalline in nature. As such, they are considered to possess only secondary porosity; their permeability is low to very low. Because of their lithified and/or cemented and/or crystalline character, these rocks do not contain groundwater in their interstices (i.e., the pore spaces) between the individual sand or gravel grains (as occurs in the potentially water-bearing deposits), but rather the groundwater is contained solely within fractures, joints, and/or along bedding planes in these types of rocks. Hence, the groundwater storage capacity of these rocks is low, and their long-term sustainable yield is unpredictable. As a result, only limited quantities of groundwater can be yielded to wells from these older rocks. As a result, all of these geologically older rocks are classified as nonwater-bearing for municipal-supply purposes in ULARA, and none of these older sedimentary or crystalline rocks are considered part of the four groundwater basins within ULARA.

More detailed descriptions of each of the four ULARA groundwater basis are available at the ULARA Watermaster website, ULARAwatermaster.com.

1.2 BRIEF HISTORY OF ADJUDICATION

A detailed history of the ULARA adjudication is provided on the ULARA Watermaster website ULARAwatermaster.com. Digital versions of various legal documents that were a part of the adjudication process are also available for download on that website. A basic summary of key milestones for the ULARA Judgment is provided below.

On September 30, 1955, the City of Los Angeles filed an action in Los Angeles Superior Court against the cities of San Fernando, Glendale, and Burbank, the Crescenta Valley Water District, and several other defendants to: (1) quiet its title and obtain a declaration of its prior rights to the water underlying the ULARA; and (2) enjoin the defendants from extracting such water other than in subordination to its prior rights. (*The City of Los Angeles v. City of San Fernando*, Los Angeles Superior Court Case No. 650079.)

The Superior Court appointed the State Water Rights Board as a referee in the action and directed it to investigate, find, and report upon certain physical facts of the ULARA. The State Water Rights Board adopted its Report of Referee, and the resulting two-volume document is dated July 27, 1962.

The cities of Burbank, Glendale, Los Angeles and San Fernando, the Crescenta Valley Water District, and several private parties with smaller water claims proceeded to a bench trial on March 1, 1966. Numerous other defendants were eliminated from the case before trial by dismissal, disclaimer, default, or stipulated judgment. On March 15, 1968, following more than 181 trial days, the judge entered a judgment.

The City of Los Angeles appealed that judgment and, on May 12, 1975, the California Supreme Court, by unanimous opinion (14 Cal. 3d 199), reversed and remanded the case. The Supreme Court affirmed the City of Los Angeles' Pueblo Water Rights to the surface waters of the Los Angeles River and all groundwater in the SFB derived from precipitation within ULARA (infiltration of direct rainfall plus surface water runoff). It held that the City of Los Angeles' Pueblo Water Rights did not extend to and/or include the groundwater in the Sylmar, Verdugo or Eagle Rock basins; however, it found all surface water runoff and groundwater underflows from these adjoining groundwater basins were part of the City of Los Angeles' Pueblo Water Rights.

As to imported water, the Supreme Court held that the City of Los Angeles had rights to all groundwater in the SFB that was derived from water the City imported from outside ULARA that was eventually spread or delivered within the SFB. The Supreme Court granted the cities of Burbank and Glendale similar rights based on water they imported from outside ULARA and delivered within SFB. Because the City of San Fernando was not a member of MWD until the end of 1971, and because it had never imported any water from outside ULARA prior to 1971, it was given no return flow rights based on a March 22, 1984-dated stipulation between the cities of Los Angeles and San Fernando.

After trial on some remaining issues on remand, and pursuant to stipulations among the parties, the Superior Court entered the Final Judgment on January 26, 1979 and also issued Findings of Fact and Conclusions of Law that same day. This Judgment remains the governing document for ULARA.

The water rights set forth in the Judgment are generally consistent with the Supreme Court's opinion, except for a provision regarding the calculation of Import Return Credit.

In 1978, the cities of Burbank, Glendale and Los Angeles agreed to use all delivered water, instead of only imported water, in the calculation of their Import Return Credit.

1.3 EXTRACTION RIGHTS

The extraction rights under the January 26, 1979 Final Judgment for the four ULARA groundwater basins and the separate August 26, 1983 (and subsequent) Sylmar Basin Stipulations are as follows:

1.3.1 San Fernando Groundwater Basin

Native Water

The City of Los Angeles has an exclusive right to extract and utilize all of the native safe yield water in the San Fernando Basin; refer to Plate 1A for the boundaries of this basin. This native safe yield, which was originally determined to be an average of 43,660 AFY, represents the Pueblo Water Right of the City of Los Angeles under the Final ULARA Judgment of 1979.

Import Return Water

The cities of, Burbank, Glendale, and Los Angeles each have a right to extract the following amounts of groundwater from the SFB:

Burbank: 20.0 percent of all delivered water, including recycled water, to the valley fill lands of the SFB and all of its tributary hill and mountain areas.

Glendale: 20.0 percent of all delivered water, including recycled water, to the valley fill lands of the SFB and all of its tributary hill and mountain areas.

Los Angeles: 20.8 percent of all delivered water, including recycled water, to the valley fill lands of the SFB and all of its tributary hill and mountain areas.

Physical Solution Water

Several private entities have been granted limited entitlement to extract groundwater from the SFB, but each such entitlement is chargeable by the Watermaster to the rights of the respective Party; that specific private entity must then pay that Party for the resulting costs

of the pumped water. Table 1-1, "Physical Solution Parties," lists the various private pumping entities and their maximum physical solution pumping volumes per year.

Table 1-1 PHYSICAL SOLUTION PARTIES

Chargeable Party	Pumping Party	Allowable Pumping (acre-feet)
City of Burbank	Valhalla[1]	300
	Lockheed-Martin	25
City of Glendale	Forest Lawn	400
	Angelica Healthcare[2]	75
City of Los Angeles	City of Glendale	5,500
	City of Burbank	4,200
	Middle Ranch[3]	50
	Hallelujah Prayer Center[4]	60
	Van de Kamp[5]	120
	Toluca Lake	100
	Sportsmen's Lodge	25
	Water Licenses	83

1. Valhalla began receiving recycled water from the City of Burbank in January 2016 and has since suspended its onsite groundwater pumping.
2. Angelica Healthcare no longer pumps its physical solution rights.
3. Well Nos. 5 & 8, and Springs 1 & 2 were sold to RJ's Property Management, and Well Nos. 6 & 7 were sold to Debra L. Cecil and Donald R. Cecil, effective February 2017. Wells 3 & 4 were acquired by RJ's Property Management effective September 2018.
4. Formerly Hathaway-Sycamore Children's Home.
5. Van de Kamp has never pumped its physical solution right.

Stored Water

Each of the cities of Burbank, Glendale, and Los Angeles has a right in the SFB to store water and a right to extract equivalent amounts of groundwater from the SFB.

1.3.2 Sylmar Groundwater Basin

Native and Import Return Water

In August 1983, the original ULARA Watermaster (Mr. Melvin Blevins) reported to the Court, pursuant to Section 10.2 of the Judgment, that the Sylmar Basin was in a condition of overdraft. In response to that Watermaster's letter and a Minute Order of the Court, the cities of Los Angeles and San Fernando responded to the Court, agreeing with the

Watermaster that a condition of overdraft existed in the Sylmar Basin at that time. The March 22, 1984 Stipulation of the Court (effective October 1, 1984) assigned the cities of Los Angeles and San Fernando equal rights to the then-current total safe yield value of 6,210 AFY for the Sylmar Basin (see basin boundaries on Plate 1B).

On July 16, 1996, the original Watermaster (Mr. Blevins) re-evaluated this safe yield value and established a temporary increase (for a 10-year period) in the safe yield of this basin from 6,210 AFY to 6,510 AFY. This temporary 10-year period ended on October 1, 2005, and triggered a re-evaluation of the safe yield of this basin by the then-current Watermaster (Mr. Mark Mackowski). That re-assessment work was once again performed using the same basic methodology as had been used previously by the former Watermaster (Mr. Blevins); this work was consistent with Section 8.2.10 of the Judgment. That re-assessment by the Watermaster (Mr. Mackowski) and by the special Consultant to the Watermaster (Mr. Blevins) resulted in a new Stipulation, which was approved by the Court on December 13, 2006. This updated safe yield assessment permitted a temporary increase in the safe yield of the Sylmar Basin to 6,810 AFY beginning October 1, 2006. That Stipulation also noted that the safe yield of the Sylmar Basin "shall be re-evaluated within 5 years after adoption of the Stipulation." The Court approved the new Stipulation after its hearing on December 13, 2006.

In 2012, the current Watermaster reassessed the safe yield of the Sylmar Basin using the same basic methodology used by two prior ULARA Watermasters (Mr. Blevins and Mr. Mackowski). That 2012-dated reassessment resulted in the following conclusions: Sylmar Basin was not in a current state of overdraft; the new safe yield of this basin could be temporarily and conditionally increased to 7,140 acre feet per year (AFY) for the cities of Los Angeles and San Fernando (this value is to be divided equally between these two cities); and these pumping amounts could continue for the five subsequent Water Years of 2011-12 through 2015-16, unless in-progress data evaluation by the Watermaster were to reveal that Sylmar Basin is being adversely affected by the increased pumping by these Parties. The 2012-dated reassessment of the safe yield of Sylmar Basin by the current Watermaster was filed with the Court in June 2013.

In a Memorandum dated October 31, 2016, the current Watermaster reviewed available data, including more recent water level records for local water wells, to assess the possible need for an updated safe yield assessment of the Sylmar Basin. Ultimately, and as stated in that Memorandum, it was the Watermaster's opinion "that overdraft is not occurring in

this basin at this time," and that "the current safe yield value of 7,140 AFY for the Sylmar Basin shall remain in effect for the next five water years (WY 2016-17 through WY 2020-21), or until such time as the Watermaster may determine that a new/updated reassessment is called for, whichever comes first."

The only potentially active, but private, party with overlying rights within the Sylmar Basin is Santiago Estates, a successor to Meurer Engineering, M.H.C. Inc. Any future pumping by Santiago Estates would be deducted from the total safe yield of this basin and the cities of Los Angeles and San Fernando would then be permitted to equally divide the remainder of the current safe yield value of this basin. However, no deductions have been required for many years because Santiago Estates has not pumped groundwater from the Sylmar Basin since the 1998-99 Water Year.

Stored Water

Each of the cities of Los Angeles and San Fernando has a right to store groundwater by in-lieu practices, and each also has a right to extract equivalent amounts of groundwater from the Sylmar Basin.

1.3.3 Verdugo Groundwater Basin

Native Water

The City of Glendale and the Crescenta Valley Water District (CVWD) have appropriative and prescriptive rights to extract 3,856 and 3,294 AFY of groundwater, respectively, from the Verdugo Basin (refer to Plate 1C for the boundaries of this basin).

Import Return Water

The City of Los Angeles may have a right to recapture its delivered (imported) water in the Verdugo Basin upon application to the Watermaster and on subsequent order after a hearing by the Court pursuant to Section 5.2.3.2 of the Judgment.

Stored Water

There are no storage rights for any party in the Verdugo Basin based on the Judgment.

1.3.4 Eagle Rock Groundwater Basin

Native Water

The Eagle Rock Basin has only a limited native safe yield. Plate 1D provides the approximate boundaries of this small groundwater basin.

Imported Return Water

The City of Los Angeles delivers imported water to lands overlying the Eagle Rock groundwater basin; return flow from this delivered water is considered to constitute most of the safe yield of this basin. The City of Los Angeles has the right to extract, or to allow to be extracted, the entire safe yield of this basin.

Physical Solution Water

DS Waters (successor to Sparkletts and Deep Rock water companies) has a physical solution right to extract groundwater from the Eagle Rock Basin pursuant to a stipulation with the City of Los Angeles, and as provided for in Section 9.2.1 of the Judgment.

Stored Water

There are no storage rights for any party in the Eagle Rock Basin, based on the Judgment.

1.4 WATERMASTER SERVICE AND ADMINISTRATIVE COMMITTEE

In preparing this Annual Watermaster Report, the Watermaster support staff at LADWP continues to collect and record a large amount of information related to the water supply, water use, water disposal, groundwater levels, water quality, and the ownership and locations of all new water-supply wells within ULARA. All groundwater pumpers are required to report their extractions on a monthly basis to the Watermaster. This allows the Watermaster staff at LADWP and the Assistant Watermaster to update all required water production accounts on a monthly basis, from which the allowable pumping by each Party for the remainder of the year can be determined by the Watermaster.

Section 8.3 of the Judgment established an Administrative Committee for the purpose of advising the Watermaster in the administration of his duties. Table 1-2 shows the current, duly-appointed members of the Committee.

Table 1-2: ULARA ADMINISTRATIVE COMMITTEE

AS OF APRIL 18, 2018	REPRESENTATIVE	ALTERNATE
CITY OF BURBANK	Bill Mace	Michael Thompson
CRESCENTA VALLEY WATER DISTRICT	David Gould *Committee Vice Chair*	Nem Ochoa
CITY OF GLENDALE	Michael De Ghetto *Committee Chair*	Richard Ruyle
CITY OF LOS ANGELES	David Pettijohn	Rafael Villegas
CITY OF SAN FERNANDO	Tony Salazar	Yazdan Emrani

The Watermaster may convene the Administrative Committee at any time in order to seek its advice, although meetings are typically held on a quarterly basis each year. The Watermaster met with the Administrative Committee on October 7, 2017, and also on January 17, 2018, April 18, 2018, and July 31, 2018 in the current 2017-18 WY. Each year the Administrative Committee is also responsible for reviewing and approving Drafts of the Annual Watermaster Report and the Groundwater Pumping and Spreading Plan prepared by the Watermaster.

On the date the Final ULARA Judgment was signed by the Court judge on January 26, 1979, a separate stipulation was filed in Superior Court, appointing Mr. Melvin L. Blevins of LADWP as the original ULARA Watermaster under the Judgment. On September 1, 2003, Mr. Mark G. Mackowski, also of LADWP, was appointed as the second ULARA Watermaster by the Superior Court, succeeding Mr. Blevins after his 24 years of service. On January 1, 2009, Mr. Richard C. Slade, Principal Groundwater Geologist for Richard C. Slade and Associates LLC, Consulting Groundwater Geologists, was appointed as the first completely independent ULARA Watermaster, thereby succeeding Mr. Mackowski after his 5 years of service.

1.5 SIGNIFICANT EVENTS THROUGH SEPTEMBER 2018

Below is a brief description of significant events that have occurred within ULARA during the current WY, i.e., October 1, 2017 through September 2018.

1.5.1 San Fernando Groundwater Basin Remediation (SFGWBR) Efforts

LADWP undertook an extensive characterization and treatment master planning evaluation of its wellfields in the SFB from 2009 through 2015. This 6-year, $11.5 million

study characterized groundwater quality and groundwater contamination in the eastern portion of the SFB. Twenty-six new monitoring wells were constructed and sampled in support of this groundwater characterization project at a cost of approximately $22 million. These new monitoring wells, along with a network of more than 70 existing water wells and monitoring wells, were used to monitoring groundwater levels and to permit groundwater sampling and laboratory testing to further characterize groundwater quality. These sites continue to be sampled to gather additional groundwater data in the northeastern portion of the SFB, which historically contains the City's most productive wellfields, including:

- Tujunga
- North Hollywood West
- Rinaldi-Toluca
- North Hollywood East (offline due to high concentrations of contaminants)

LADWP plans to complete one or more response actions for each wellfield in substantial compliance with the National Contingency Plan (NCP). The NCP provides the organizational structure and procedures for responding to releases and threatened releases of hazardous substances, pollutants, and contaminants.

LADWP has also begun evaluating potential response actions to restore the beneficial use of groundwater in the vicinity of its various wellfields. These efforts include the study and other analysis and activities as required by the NCP to evaluate appropriate response actions. While additional work is required to evaluate the appropriate interim and final response actions for each area, one potential set of alternatives would consist of a series of local and centralized water treatment facilities to produce water for potable use.

The information that LADWP will evaluate includes an analysis of pumping rates and treatment capacity that would be appropriate to capture contaminant mass and to help restore the beneficial use of the aquifers in each wellfield. LADWP also plans to evaluate ways to minimize the volume of water that would require treatment by giving priority to wells with higher levels of contamination, thereby minimizing the potential for contamination to spread to other wells that currently do not contain concentrations of contaminants that require treatment.

These LADWP analyses will also evaluate other approaches, such as in situ treatment (treating contamination in the ground), construction of new extraction wells, and the purchase of replacement water alternatives, among other options.

LADWP will initially focus on response actions within their most productive wellfields in the San Fernando Basin (North Hollywood West, Rinaldi-Toluca, and Tujunga wellfields) where the impact of the contamination on the beneficial use of the aquifers is most severe, and at its Pollock water-supply wells that lie along the Los Angeles River, just north of the location where surface water and groundwater flow out of the SFB. The North Hollywood East wellfield would not be part of this approach because it would be addressed through targeted treatment to be implemented by potentially responsible parties (PRPs) under the oversight of USEPA.

Construction of the North Hollywood West Wells Remediation Facility started in September 2017. This facility will have the capacity to treat contaminated groundwater and is scheduled to be completed in late-2019.

1.5.2 Mission Wells Improvement Project

The purpose of the Mission Wells Improvement Project is to rehabilitate and replace deteriorating groundwater facilities in the Sylmar Basin, and the Project includes the construction of three new production wells, new monitoring wells, new piping and pump station upgrades, electrical upgrades, and new controls. Once completed, the project goals are to provide up to 3,077 AFY of potable groundwater supply for the first 15 years, and 2,477 AFY thereafter.

Construction of one monitoring well was completed in January 2015 and construction of two additional monitoring wells was completed in June 2016. Three production wells (PWs), PW-08, PW-09, and PW-10, have been drilled, constructed, developed, and flow tested; in addition, initial Title 22 water quality samples have been collected for laboratory testing. PW-08 was found to have a limited pumping capacity. Further, groundwater sampling from PW-09 revealed high TCE concentrations, which will require a future project for wellhead treatment. Well flow testing data for PW-10 were used to size and procure a new permanent pump. Installation of the new submersible pump and flowmeter is scheduled for December 2018.

The onsite Chlorination Generation System for this wellfield has been permitted and is in operation. Construction for the electrical upgrades, which is currently 98% complete,

included: a new Industrial Station, Switchgear, and related equipment to allow for 34.5KV power to the site. Also included is the New Pump Station structure, which will enclose the 3 pumps (capable of 12 cfs), motor controllers, and the wellfield control house. Construction for the electrical upgrades will be completed in December 2018, followed by a commissioning period and overall completion is expected in January 2019.

1.5.3 Van Norman Complex Investigation

Two exploratory wells designated VN-EW-01 and VN-EW-02, were drilled on the LADWP Van Norman Complex property in 2015 to investigate the existence and extent of potable groundwater at depth (~1,500' bgs) within the underlying Saugus Formation. Results of short-term aquifer testing performed in 2015 and 2017 indicated significant potential production capacity. Long-term testing was recommended by LADWP staff to study the feasibility and viability of producing groundwater from the Saugus Formation for use as a local supply source and as an emergency supply source. To support execution of the long-term aquifer testing, the Van Norman Exploratory Wells Projects (Project) was initiated under the Water System's Capital Improvement Program (CIP). CIP Projects follow the Water System's project delivery process from the initial conception (Project Initiation) through planning, design, construction, and post construction (Project Closeout). As of September 2018, this Project is in the Planning phase.

1.5.4 Water Recycling Programs in the San Fernando Valley

During the period from October 1, 2017 to September 30, 2018, LADWP began serving the following facilities within ULARA with recycled water (also listed are the source of recycled water, the date connected, and amount of water provided):

- Warner Brothers Studios – 15 AFY
    - provided from the Los Angeles-Glendale Water Reclamation Plant (LAG WRP); began in February 2018
- Woodbury University – 38 AFY
    - provided from the Burbank WRP; began in March 2018

1.5.5 City of Los Angeles Groundwater Replenishment Project

LADWP, in partnership with the Los Angeles Bureau of Sanitation (LASAN), is moving forward with the Groundwater Replenishment Project (GWR); this project will be implemented in phases. The City is applying to the Regional Water Quality Control Board – Los Angeles for a permit to spread up to 3,500 AFY as part of the Initial Phase of the

GWR Project. Initial Phase spreading operations are scheduled to begin in 2019. Concepts for future phases are being explored, including construction of an East-West Valley Interceptor Sewer, recirculation of recycled water from lakes in the Sepulveda Basin, and additional treatment to increase the Recycled Water Contribution.

In April 2018, LADWP completed the North Hollywood Water Recycling Project. Approximately 26,000 feet of new recycled water mainline were installed to extend Burbank's recycled water lines into the City of Los Angeles to serve LADWP customers. The first customer for this project, the Chandler Bike Path, was connected in August 2017. Other customers include Whitnall Dog Park, East Valley High School, Caltrans freeway landscaping, the Metro Orange Line, North Hollywood High School, Valley Village Park, and North Hollywood Park. A fill station was installed on Chandler Boulevard for Bureau of Street Services to use for street sweeping, and for LASAN to use for sewer flushing with "vactor" (vacuum tanker) trucks.

1.5.6 LADWP Stormwater Capture Program

1.5.6.1 Completed Centralized Stormwater Capture Projects

Centralized projects implemented to date have increased the amount of stormwater captured on an annual basis by an average of 10,600 AFY, according to LADWP. Below are examples of recently-implemented centralized projects:

- Big Tujunga Dam Seismic Retrofit Project
- Sheldon-Arleta Gas Management
- Hansen Spreading Grounds Upgrade

1.5.6.2 Completed Distributed Stormwater Capture Projects

LADWP's distributed projects within the San Fernando Basin that have already been implemented have increased the amount of captured stormwater by an average of 394 AFY, according to LADWP. Below are examples of recently implemented distributed projects:

- Elmer Avenue Neighborhood Green Street/Elmer Paseo Green Alley Stormwater Infiltration Projects
- Garvanza Park Stormwater Capture Use and Infiltration Project
- Glenoaks-Sunland Stormwater Infiltration Projects
- Laurel Canyon Boulevard Green Street Stormwater Infiltration Project

- Los Angeles Beautification Team Stormwater Capture Project
- North Hollywood Alley Retrofit BMP Demonstration Project
- Sun Valley Economic Development Administration Public Improvement Project
- Sun Valley Park Stormwater Infiltration Project
- Woodman Avenue Median Stormwater Infiltration Project

A summary of existing distributed stormwater capture projects and estimates prepared by each Party that shows the annual volume of stormwater captured in ULARA via these distributed projects is included in Appendix F.

1.5.6.3 Future Centralized Stormwater Capture Projects

Within the next five years, the following centralized projects are expected to be implemented within ULARA; they will reportedly provide an estimated 31,434 AF of increased groundwater recharge annually to SFB, according to LADWP. Below is a list of these future projects:

- Alexandria Park
- Big Tujunga Dam Sediment Removal
- Branford Spreading Basin Upgrade
- Bull Creek Pipeline
- Canterbury Power Line Easement
- David M Gonzales Recreation Center
- East Valley Baseball Park Infiltration System
- Fernangeles Park
- Hansen Dam Water Conservation
- Lopez Spreading Grounds Upgrade
- North Hollywood Powerline
- Pacoima Spreading Grounds Upgrade
- Pacoima Dam Sediment Removal
- San Fernando Regional Park
- Tujunga Spreading Grounds Enhancement
- Valley Village Park
- Valley Plaza Park

- Whitnall Highway Power Line Easement

1.5.6.4 Future Distributed Stormwater Capture Projects

Within the next five years, the following distributed projects are expected to be implemented that will provide an estimated 1,876 AF of increased groundwater recharge per year, according to LADWP. Below is a list of these future projects:

- Agnes Ave - Vanowen to Kittridge
- Bradley Green Alley
- Branford St - Laurel Cyn to Pacoima Wash
- Burbank Boulevard BMP
- Glenoaks - Filmore
- Glenoaks Greenway
- Great Street - Lankershim Blvd - Chandler to Victory
- Great Street - Van Nuys Blvd - Laurel to San Fernando
- Lankershim Blvd - Tuxford to Sherman
- Magnolia - Vineland to Cahuenga
- Moreheart Ave Green Street
- North Hollywood Recreation Center
- San Fernando Gardens
- San Fernando Community Health Center
- Saticoy St - Tujunga to Vineland
- Van Nuys Blvd Median
- Van Nuys - Sherman Oaks Park
- Victory-Goodland Median
- Whitnall Gardens

1.5.7 Crescenta Valley County Park Stormwater Recharge Study

CVWD received a $158,450 Local Groundwater Assistance Grant in March 2014 from DWR to study the feasibility of using portions of Crescenta Valley County Park (CVC Park) to recharge the Verdugo Basin with stormwater runoff. The study included installation of flow monitoring stations in the Verdugo Wash, installation of two monitoring wells, soil percolation testing and updating its own Verdugo Basin groundwater model. The study

was completed during WY 2016-17 and indicated that about 300 to 500 AFY of stormwater could reportedly be recharged into the Verdugo Basin, according to CVWD's report. CVWD will be preparing a conceptual plan with an engineer's cost estimate during WY 2018-19 for installation of infiltration galleries in CVC Park and piping to direct stormwater from the Verdugo Wash into those infiltration galleries. CVWD has met with Los Angeles County - Public Works Department, the City of Glendale, and the City of Los Angeles regarding implementation of this project. During WY 2018-19, CVWD is planning to meet and confer with the City of Los Angeles regarding Pueblo Water Rights as they pertain to the proposed project. CVWD is also planning to submit an application during WY 2018-19 to the State Division of Water Rights for diversion of flow in the Verdugo Wash, and CVWD will also be preparing CEQA documentation during WY 2018-19 for approval by local agencies.

1.5.8 Burbank Participation in MWD Cyclic Storage Program

Burbank entered into a cyclic groundwater storage agreement with MWD beginning in WY 2016-17; 894.4 AF were spread by Burbank in the Lopez and Pacoima spreading basins as part of this agreement during WY 2017-18. Purchases of the "cyclical agreement" water are spread out over time on a schedule agreed upon between Burbank and MWD. For Watermaster purposes, there is no distinction between the spreading of "cyclic agreement" water or non-"cyclic agreement water" with respect to credit calculation, and no distinction is discussed in the remainder of this document.

1.6 SUMMARY OF WATER OPERATIONS IN ULARA

Highlights of the various elements of water operations within ULARA for the Water Years 2016-17 and 2017-18 are summarized in Table 1-3. Also shown on Table 1-3 are the values that are input into the Sustainable Groundwater Management Act (SGMA) website, and information showing how those values are calculated. Details of WY 2017-18 operations and hydrologic conditions are provided in Section 2. The Groundwater Extractions Report provided in Appendix A summarizes the groundwater extractions for WY 2017-18 by all ULARA pumpers. Locations of the four ULARA groundwater basins are shown on Plate 1, whereas the individual water service areas of the Parties and individual producers within ULARA are shown on Plate 2. Other pertinent hydrologic facilities used to measure precipitation, runoff, and water levels are provided on Plates 1 through 8.

1.6.1 Construction/Destruction of Water Wells

No water wells were constructed in any of the four groundwater basins in ULARA in WY 2017-18. Burbank Well No. 15 was removed from service and destroyed in WY 2017-18. LADWP North Hollywood Well Nos. 11 and 24 were removed from service and destroyed in WY 2017-18. No other wells were destroyed in any of the four ULARA groundwater basins in WY 2017-18.

Table 1-3 SUMMARY OF OPERATIONS IN ULARA

Item	Water Year 2016-17	Water Year 2017-18	Calculation	SGMA Section Reporting
Active Pumpers (parties and nonparties)	36	36		
Inactive Pumpers (parties)[1]	7	7		
Annual Weighted Average Rainfall, in inches				
Valley Floor	18.43	7.14		
Mountain Area	23.87	9.40		
Total ULARA	21.78	8.53		
Spreading Operations, in acre-feet				
Native Water Spread	22,021	3,154	A	Section C Water available for recharge or in-lieu use by source type (if available): Local Surface
MWD Water Spread	11,791	8,095	B	
Groundwater Spread	0	0	C	
Total	**33,812**	**11,249**	D = A+B+C	
Extractions, in acre-feet	61,076	62,524	E	Section B Total Groundwater Extraction
Gross Imports, in acre-feet				
Los Angeles Aqueduct (LAA) Water	284,836	288,843	F	
MWD Water [2]	163,649	188,591	G	
Total	**448,485**	**477,434**	H = F+G	
Exports, in acre-feet				
Los Angeles Aqueduct Water	150,341	134,769	I	
MWD Water	72,732	74,853	J	
Groundwater	32,710	31,437	K	
Total	**255,783**	**241,059**	L = I+J+k	
Net LAA Deliveried, in acre-feet	134,495	154,074	M = F-I	Section C Water available for recharge or in-lieu use by source type (if available): Local Imported
Net MWD Delivered, in acre-feet	90,917	113,738	N = G-J	Section C Water available for recharge or in-lieu use by source type (if available): Other
Net Groundwater Delivered in ULARA in acre-feet	28,366	31,087	O = E-K	Section D Water Use Met by Source Type: Groundwater
Net Imports Delivered in ULARA in acre-feet	225,412	267,812	P = M+N	Section D Water Use Met by Source Type: Surface
Net Surface Water Used in ULARA in acre-feet	247,433	270,966	Q = A+M+N	Section C Surface Water Supply
Recycled Water Used in acre-feet	15,914	18,659	R	Section D Water Use Met by Source Type: Recycled
Total Water Delivered in ULARA in acre-feet	269,692	317,558	S = O+P+R	Section D Total Water Use in ULARA
Treated Wastewater, in acre-feet [3]	82,789	74,633		
Change in Groundwater Storage				
San Fernando Basin	16,567	(7,479)	T	
Sylmar Basin	4,113	3,994	U	
Verdugo Basin	4,466	4,487	V	
Eagle Rock Basin	(107)	(92)	W	
Total	**25,039**	**910**	X = T+U+V+W	Section E Annual Change in Groundwater Storage

1. The seven inactive pumpers are Van de Kamp, Disney, Angelica, Santiago Estates, Greeff, Sears, and Waste Management.
2. MWD Gross Imports includes water spread for groundwater replenishment by the City of Burbank.
3. Most treated wastewater is discharged to the Los Angeles River, whereas a portion is delivered to the Hyperion Plant or to other locations which utilize recycled water.

1.7 ALLOWABLE PUMPING FOR THE FORTHCOMING WATER YEAR

Table 1-4 provides a summary of the allowable groundwater extraction rights for the municipal-supply Parties in each of the three major groundwater basins in ULARA for the forthcoming water year, along with the current Stored Water Credit, where applicable, for each Party. The method to determine these values is described in more detail in Section 2.

Table 1-4 ALLOWABLE GROUNDWATER EXTRACTION RIGHTS FOR FORTHCOMING WY

(all units in acre-feet)	Native Safe Yield Credit [1]	Import Return Credit [2]	Total Native + Import	Stored Water Credit [3, 4] (as of Oct. 1, 2018)	Allowable Pumping 2018-19 Water Year[5]
San Fernando Basin					
City of Burbank	---	3,919	3,919	21,198	25,117
City of Glendale	---	4,405	4,405	25,215	29,620
City of Los Angeles	43,660	37,220	80,880	591,460	672,340
Total	43,660	45,544	89,204	637,873	727,077
Sylmar Basin					
City of Los Angeles	3,570	---	3,570	9,014	12,584
City of San Fernando	3,570	---	3,570	404	3,974
Total	7,140	---	7,140	9,418	16,558
Verdugo Basin					
CVWD	3,294	---	3,294	---	3,294
City of Glendale	3,856	---	3,856	---	3,856
Total	7,150	---	7,150	---	7,150

1. Native Safe Yield extraction right per page 11 of the Judgment.
2. Import Return extraction right per page 17 of the Judgment.
3. There is no Stored Water Credit assigned in Verdugo Basin.
4. See Table 2-17 for calculation of SFB Totals and Stored Water Credits in reserve; see Table 2-18 and Table 2-19 for Sylmar Basin credit calculation.
5. Allowable pumping in Sylmar Basin must not exceed the native safe yield by more than 1,200 AF in any given year. Pumping in excess of the Safe Yield must be reported to Watermaster in advance or as soon as is reasonably practicable.

2 WATER SUPPLY, OPERATIONS, AND HYDROLOGIC CONDITIONS

2.1 PRECIPITATION

Precipitation varies considerably throughout ULARA depending on such local factors as site location, topography, elevation, and season. Mean annual precipitation ranges from about 14 inches at the western end of the San Fernando Valley to approximately 33 inches near the higher elevations of the watershed in the San Gabriel Mountains in the northeasterly portion of ULARA. Approximately 80 percent of the annual rainfall in ULARA occurs from December through March.

Table 2-1 provides rainfall data from several rain gages (stations) on the valley floor areas and in the hill and mountain areas for the current WY. The locations of these rain gages are shown on Plate 3. Appendix B shows the actual monthly rainfall totals on the valley floor and in the hill and mountain areas in ULARA for the current WY for these rain gages.

Because annual rainfall totals have a very important impact on the availability of surface water and recharge to the groundwater in the four ULARA groundwater basins, which in turn influence groundwater levels, the Watermaster acquired additional rainfall data available from the local City of Burbank Valley Pump Plant rain gage (Gage No. 041194). The period of record for this gage extends from 1940 to present. These rainfall data were accessed through the website of the Western Regional Climate Center (WRCC). The available data recorded by this gage are shown as a bar graph of total rainfall for each water year (i.e., October 1 of one year through September 30 of the next year) on Figure 2-1.

To help identify possible trends in annual rainfall for each water year at this rain gage, the Watermaster further created the accumulated rainfall departure graph shown on Figure 2-2. This graph illustrates the accumulated departure of annual rainfall for each water year from the long-term average annual rainfall at the Burbank Valley Pump Plant Gage (Gage No. 041194) gage. On this graph, the accumulated rainfall departure values have been plotted for each rainfall year relative to the long-term average annual rainfall for this Burbank rain gage. The purpose of the accumulated departure curve is to illustrate temporal trends in rainfall.

To prepare this accumulated departure curve of annual rainfall, the following steps were taken:

1. Calculate the average (mean) water year rainfall for the period of record (the long-term average).
2. Begin with the initial year of rainfall in the period of record and subtract that value from the long-term average rainfall.
3. Divide that difference by the long-term average annual rainfall. This quotient represents the value for the initial year of rainfall; it may be a negative or positive number, depending on whether the total rainfall in the initial year was less than, or greater than, respectively, the long-term average annual rainfall.
4. The percentage of departure from the long-term average is then calculated in a similar manner for each successive water year and this value is algebraically added to the result for the prior water year, and so on, through the final year of available data.

Interpretation of the accumulated departure curve presented on Figure 2-2 is as follows:

- When the accumulated departure curve descends over time to the right, the total rainfall in each water year during that period tended to be at or below the long-term average annual rainfall. Hence, such a period displayed generally deficient rainfall; in essence, a dry period or drought had occurred. Examples of such dry periods on Figure 2-2 are: 1943-44 through 1975-76 and 1982-83 through 1990-91.

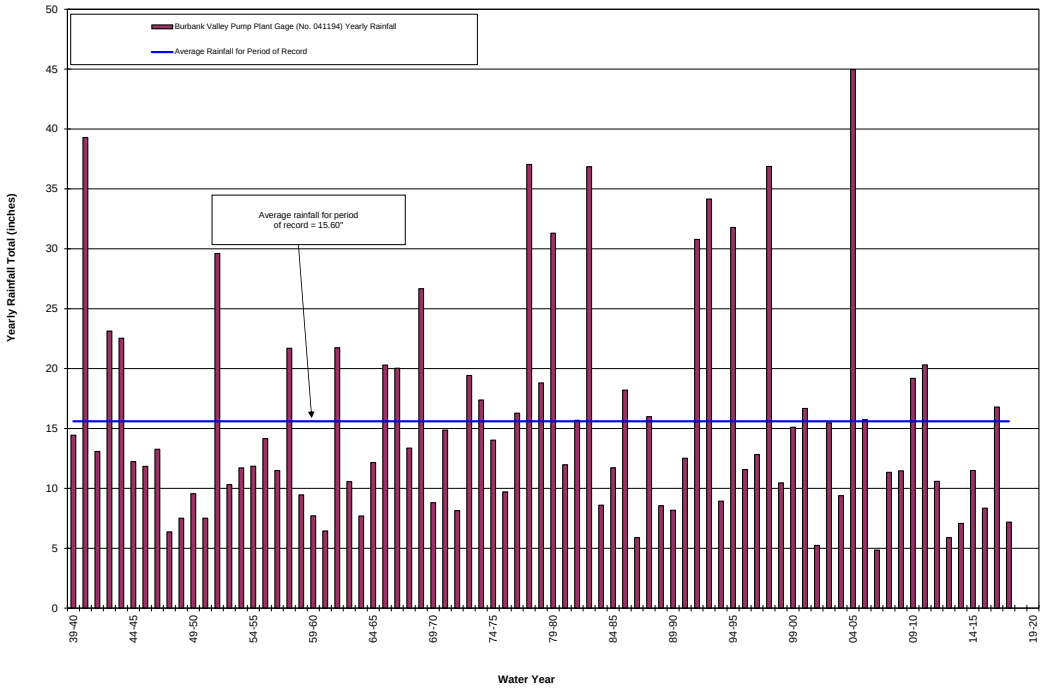
- In contrast, when the accumulated departure curve ascends over time to the right, the total rainfall in each water year during that period tended to be at or above the long-term average annual rainfall. Thus, such a period displayed generally abundant rainfall. In essence, a wet period occurred. Examples of such wet periods on Figure 2-2 are 1975-76 through 1982-83 and 1990-91 through 1997-98.

Table 2-1 WY 2017-18 PRECIPITATION

Water Year 2017-18 (inches)				
Gage No.	**LACDPW Rain Gage Stations**	**2017-18 Precipitation**	**100-Year Mean (1881-1981)**	**Percent of 100-Year Mean**
	Valley Floor Stations			
13C	North Hollywood - Lakeside	6.48	16.63	39%
1107D	La Tuna Debris Basin	6.96	14.98	46%
465C	Sepulveda Dam	5.71	15.30	37%
21B	Woodland Hills	6.31	14.60	43%
735H	Bell Canyon Debris Basin	6.42	15.19	42%
25C	Northridge - LADWP	7.38	15.16	49%
251C	La Crescenta	11.02	23.31	47%
AL464	Pacoima Wash Spreading Grounds	7.43	17.32	43%
	Weighted Average[1]	**7.14**	**16.48**	**43%**
	Hill & Mountain Stations			
10A	Bel Air Hotel	8.46	18.50	46%
17	Sepulveda Canyon At Mulholland	8.37	16.84	50%
33A	Pacoima Dam	9.69	19.64	49%
47D	Clear Creek-City School	11.81	33.01	36%
53D	Colby's Ranch	8.98	29.04	31%
54C	Loomis Ranch-Alder Creek	8.23	18.62	44%
210C	Brand Park	6.78	19.97	34%
1222	Northridge - Garland	9.04	17.52	52%
1074	Little Gleason	12.40	21.79	57%
	Weighted Average[1]	**9.40**	**21.76**	**43%**
	Weighted Average Valley Floor and Hill & Mountain Areas[1]	**8.53**	**19.64**	**43%**

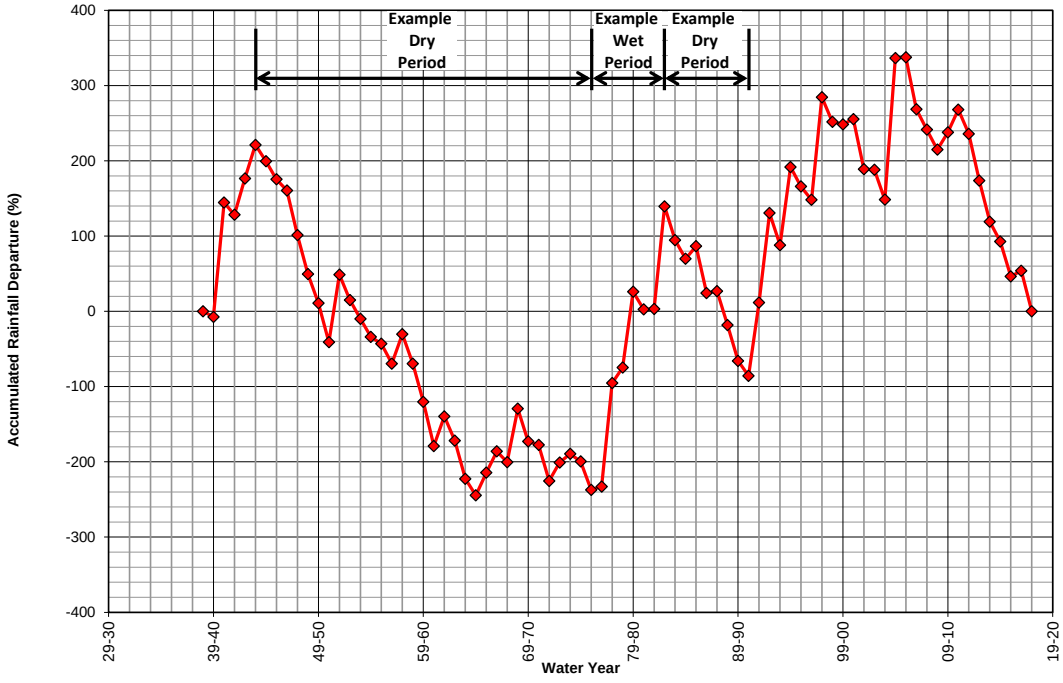
1. Weighted Averages calculated using methodology provided in the Report of Referee-July 1962. Hill & Mountain Station Weighted Average estimated due to incomplete data sets that exist in the 100-year period for which the average is calculated.

Figure 2-1 YEARLY RAINFALL TOTALS, BURBANK VALLEY PUMP PLANT RAIN GAGE



1. Yearly rainfall data compiled from Western Regional Climate Center (WRCC).
2. X-axis divisions are equal to 1 year.

Figure 2-2 ACCUMULATED RAINFALL DEPARTURE CURVE BURBANK VALLEY PUMP PLANT RAIN GAGE



2.2 RUNOFF AND OUTFLOW FROM ULARA

The entire ULARA watershed (including the surface areas of its four groundwater basins) contains 328,500 acres. Of this total, 205,700 acres lie within the tributary hill and mountain areas, whereas the remaining 122,800 acres represent the combined surface areas of the four groundwater basins within ULARA. The drainage system in ULARA is made up of the Los Angeles River and its tributaries. Surface flow in ULARA originates as: runoff from the hills and mountains; runoff from the impervious areas of the valley floor; industrial and sanitary waste discharges; runoff of excess domestic irrigation; and local areas of rising groundwater.

Several stream gaging stations are maintained throughout ULARA by the Los Angeles County Department of Public Works (LACDPW) and the United States Geological Survey (USGS). For the Annual Watermaster Report, six key gaging stations have been utilized over the years to quantify surface water runoff from the main tributary areas of the ULARA watershed. From upstream to downstream, these six gaging stations (see locations on Plate 3) are as follows:

- Station F-118C-R, which monitors all releases from Pacoima Dam. Runoff below this point flows to the Los Angeles River through lined channels, or it can be diverted to the Lopez and Pacoima spreading grounds for artificial recharge purposes. Note that the downstream Station F-118C-R replaced Station F-118B-R beginning in June 2012.

- Station F-168B-R, which records all releases from Big Tujunga Dam. This dam lies in the hill and mountain area to the northeast and collects runoff from that northeastern portion of the watershed. Runoff below this point flows through Hansen Dam, and then into the Los Angeles River. Releases from this point can be diverted for artificial recharge purposes to the Hansen or Tujunga spreading grounds. Note that Station F-168B-R replaced Station F-168-R beginning in June 2012.

- Station F-300-R, which monitors all flow in the main channel of the Los Angeles River west of Lankershim Boulevard, includes the outflows from Pacoima and Hansen dams that are not otherwise diverted to spreading grounds. Records from this station also include flow through the Sepulveda Dam and releases of reclaimed wastewater discharged by the City of Los Angeles from the Tillman WRP.

- Station E-285-R, which monitors flow from the western slopes of the Verdugo Mountains and tributary areas in the ULARA watershed located east of Lankershim Boulevard. This station also records releases of reclaimed wastewater discharged by the City of Burbank.
- Station F-252-R, which monitors flow from Verdugo Canyon, includes flows from Dunsmore and Pickens Canyons.
- Station F-57C-R, which lies in the main channel of the Los Angeles River just north and upstream of its confluence with the Arroyo Seco, records all surface outflows from ULARA.

Table 2-2 summarizes the monthly runoff for these six stations for Water Years 2016-17 and 2017-18. The daily mean discharge volumes recorded during the current WY for these six stations are summarized in Appendix B.

Table 2-2 MONTHLY RUNOFF AT SELECTED GAGING STATIONS

Station	Water Year	(acre-feet) OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
F-118C-R	2016-17	4	0	0	1,810	1,780	459	699	1,140	523	0	685	652	**7,752**
Pacoima Dam	2017-18	0	468	0	49	181	210	214	0	465	345	0	0	**1,932**
F-168B-R	2016-17	124	115	121	1,640	5,920	1,920	791	823	511	484	269	243	**12,961**
Big Tujunga Dam	2017-18	197	0	0	27	0	27	0	312	273	191	190	188	**1,405**
F-300-R	2016-17	3,440	5,470	14,430	30,250	28,610	4,120	3,320	3,240	2,850	2,680	2,850	3,040	**104,300**
L.A. River Tujunga Ave.	2017-18	4,100	4,380	4,630	14,500	4,650	25,560	3,530	3,650	3,110	3,150	3,690	3,530	**78,480**
E-285-R	2016-17	395	606	785	1,620	1,940	317	465	415	229	181	196	309	**7,458**
Burbank Storm Drain	2017-18	302	412	735	1,160	628	1,330	307	316	88	147	152	185	**5,762**
F-252-R	2016-17	177	387	643	1,290	1,070	191	152	173	152	141	49	72	**4,497**
Verdugo Wash	2017-18	20	19	8	760	63	1,050	66	97	29	18	37	67	**2,234**
F-57C-R	2016-17	4,840	9,260	25,980	54,400	40,610	8,210	6,080	3,790	2,470	2,670	2,700	3,200	**164,210**
L.A. River Arroyo Seco	2017-18	3,550	4,110	5,420	16,840	8,820	33,400	4,670	3,950	3,740	3,510	3,300	3,520	**94,830**

2.3 COMPONENTS OF SURFACE FLOW

The surface flow of the Los Angeles River at Gaging Station F-57C-R consists of:

1. Storm water runoff;
2. Treated wastewater from the Tillman, Burbank, and Los Angeles-Glendale WRPs;
3. Industrial discharges and runoff of excess domestic irrigation; and

4. Rising groundwater.

Storm flows are typically the largest component of the total surface flow recorded at Gage F-57C-R, and these storm flows occur principally in the winter months (see Table 2-3 and also Appendix C for a detailed breakdown of the components of Los Angeles River flow).

A significant factor affecting surface water runoff in the Los Angeles River has been the releases of treated wastewater over time by the three local WRPs mentioned above. Specifically, releases from the Los Angeles-Glendale WRP, the Burbank WRP, and the Tillman WRP appear to have begun in 1976-77, 1967, and 1985, respectively.

Industrial discharges and runoff of excess irrigation water upstream of Gage F-57C-R are relatively small, but cumulatively they contribute a moderate amount of surface flow to the Los Angeles River. Field inspection during WY 1998-99 confirmed year-round unmetered flows of domestic irrigation runoff from residential areas, golf courses and industrial sites.

Rising groundwater is a constant source of loss from the Verdugo and San Fernando groundwater basins. Rising groundwater occurs above the Verdugo Wash Narrows, and in the unlined reach of the Los Angeles River immediately upgradient from Gage F-57C-R. Outflows at Gage F-57C-R include rising groundwater leaving the Verdugo Basin past Gage F-252-R. Table 2-3 provides these calculated rising water values for the current WY.

Releases of treated (reclaimed) wastewater also have an influence on rising groundwater. These large year-round releases tend to keep the alluvium beneath the Los Angeles River saturated, even in dry years. Nevertheless, there is some opportunity for continuing percolation in the unlined reaches of this river, both upstream and downstream of the lined section of the river near its confluence with the Verdugo Wash. Water percolating in the unlined reaches is thought to percolate through the shallow alluvial zones and to reappear as rising groundwater along the river downstream from Los Feliz Boulevard. There may also be up to 3,000 AFY of recharge from delivered water within the Los Angeles River Narrows-Pollock Wellfield area that contribute to this rising groundwater condition.

In the Report of Referee (1962, Volume II, Appendix O), procedures were developed for calculating the volume of rising groundwater for the original safe yield base period of 1928-1958. Some of the important factors that were active at the time of that study but have since been discontinued include: local releases of Owens River water; operation of the Chatsworth Reservoir; and operation of the Headworks Spreading Grounds. As shown on Figure O-2 of the Report of Referee (1962), excess rising groundwater was considered

to have declined to essentially zero by the late-1950s. The January 1993 report by Brown and Caldwell, "Potential Infiltration of Chlorides from the Los Angeles River Narrows into the Groundwater Aquifer," assessed groundwater levels along the course of the Los Angeles River; the then-current Watermaster provided the data for that 1993 evaluation. At the end of the drought period in 1977, groundwater levels in the Los Angeles River Narrows were very low; hence, there was very little potential for having excess rising groundwater at that time in that area. However, increased rainfall and runoff occurred during the 1978-83 period, combined with reduced pumping by the Crystal Springs, Grandview, and Pollock wellfields, created large rises in groundwater levels in the Los Angeles River Narrows. Elevated groundwater levels, such as those that typically follow periods of heavy rainfall, tend to increase the volumes of rising groundwater in the Los Angeles River Narrows.

Finally, the methodology used to calculate rising groundwater (Table 2-3) needs to be improved. Over the years, many of the original gaging stations along the Los Angeles River and its tributaries have been lost, abandoned, or damaged. Actual data from some of these gaging stations have been replaced by estimates, and the LADWP-operated groundwater flow model has been used to check the results. Although the current methodology provides an approximation, it is considered to be less accurate than using actual gage data. To improve the calculation of rising groundwater, the abandoned, lost, damaged, or inaccurate gaging stations need to be identified, and then these stations should be either rehabilitated or replaced entirely.

The first site visit to these types of gages occurred in March 2014, when the current Watermaster visited gage site F-57C-R, along with representatives from the LACFCD and LADWP. It was determined from this site visit that LACFCD field monitoring staff had begun experiencing problems in 2005 in obtaining accurate measurements of low runoff flows in the bottom of the lined river channel at Gage F-57C-R. Some of these problems were a result of vandalism and theft of copper wires required for electrical supply to the gage. High flows resulting from storm events have been and continue to be collected by LACFCD using a staff gage on the vertical concrete sides of the lined river channel near this gage. In 2011, the City of Los Angeles Bureau of Engineering (LABOE) also initiated construction of the nearby Riverside Drive Viaduct Replacement Project (including a new bridge). This new construction, which took place immediately above and surrounding Gage F-57C-R, further impacted gage operation. To help ensure accurate measurements of low runoff flows at Gage F-57C-R, the Watermaster participated in several meetings

with all parties involved. As a result of these meetings, the Watermaster was satisfied that the low-flow stream measurements that were currently and would continue to be recorded at Gage F-57C-R by LACFCD were sufficiently accurate for ULARA Watermaster purposes, and that this gage will be maintained in the future by LACFCD to continue to provide accurate measurements. The Watermaster updated the Court on this specific matter in a Special Hearing before the Judge on April 25, 2014. Project construction ended in March 2016 and all nearby concrete K-rails were removed in roughly May 2016.

After the storms of January 2017, a large amount of debris settled into the Gage F-57C-R station and impacted the measurement accuracy of low flows (of 150 cfs and less); the data collected for the gage were more accurate at flows greater than 150 cfs at that time. This debris was partially removed in March 2017, which improved accuracy. The remaining debris was completely removed in April 2017, which returned the station to its normal operational condition. The monitoring at this station is currently functioning as intended, i.e., to monitor and record the surface water runoff flows at 5-minute intervals.

Table 2-3 ESTIMATED SEPARATION OF SURFACE FLOW, F-57C-R & F-252-R

	F-57C-R (acre-feet)				F-252-R (acre-feet)		
Water Year	Rising Groundwater[1]	Waste Discharge	Storm Runoff	Total Outflow	Rising Groundwater[2,3]	Storm Runoff [3]	Total Outflow
2017-18	1,701	61,255	31,860	94,816	2,230	4,396	6,626
2016-17	5,616	71,965	72,815	150,396	4,536	9,306	13,842
2015-16	2,570	55,310	23,970	81,858	1,279	1,215	2,494
2014-15	3,300	63,757	38,777	105,834	3,974	747	4,721
2013-14	1,417	61,260	21,456	84,133	2,553	457	3,010
2012-13	1,754	67,865	27,711	97,330	1,156	1,098	2,254
2011-12	3,121	69,176	36,603	108,900	2,068	2,662	4,730
2010-11	6,588	88,541	135,815	230,945	2,397	18,023	20,420
2009-10	5,814	74,736	75,150	155,700	2,394	11,936	14,330
2008-09	2,698	73,983	66,882	142,563	2,097	7,808	9,905
2007-08	3,905	76,287	96,548	176,740	1,212	8,700	9,912
2006-07	1,720	72,544	21,236	95,500	1,272	6,668	7,943
2005-06	5,441	74,256	77,063	156,760	1,414	12,717	14,131
2004-05	6,309	70,828	423,293	500,430	5,198	31,874	37,072
2003-04	3,330	90,377	42,153	135,860	2,468	2,851	5,319
2002-03	3,869	75,159	106,862	185,890	3,167	5,183	8,350
2001-02	2,126	74,737	43,937	120,800	1,819	5,721	7,540
2000-01	3,000	91,795	94,065	188,860	1,500	6,370	7,870
1999-00	1,980	78,009	62,202	142,190	824	4,243	8,470
1998-99	2,000	72,790	39,110	113,900	1,000	2,534	7,250
1997-98	4,000	97,681	245,079	346,730	4,000	12,140	16,140
1996-97	3,000	75,827	76,485	155,312	3,000	13,860	16,860
1995-96	3,841	86,127	61,188	151,156	2,577	10,946	13,523
1994-95	4,900	66,209	367,458	438,567	4,809	28,881	33,696
1993-94	2,952	60,594	73,149	136,695	1,387	6,156	7,543
1992-93	4,900	77,000	478,123	560,023	3,335	20,185	23,520
1991-92	3,000	120,789	197,040	320,829	1,412	13,209	14,621
1990-91	3,203	75,647	117,779	196,629	1,157	6,865	8,022
1989-90	3,000	76,789	55,811	167,639	1,182	2,938	4,120
1988-89	3,000	80,020	56,535	136,843	1,995	4,453	6,448
1987-88	3,000	81,920	74,074	156,204	3,548	10,493	14,041
1986-87	3,000	64,125	19,060	83,295	2,100	1,690	3,790
1985-86	3,880	48,370	102,840	155,090	2,470	6,270	8,740
1984-85	3,260	21,600	46,300	71,160	2,710	3,970	6,680
1983-84	3,000	17,780	49,090	69,870	4,000	n/a	n/a
1982-83	3,460	17,610	384,620	405,690	5,330	21,384	26,714
1981-82	1,280	18,180	80,000	99,460	3,710	5,367	9,077
1980-81	4,710	19,580	51,940	76,230	5,780	2,917	8,697
1979-80	5,500	16,500	n/a	n/a	5,150	7,752	12,902
1978-79	2,840	16,450	119,810	139,100	2,470	n/a	n/a
1977-78	1,331	7,449	357,883	366,663	1,168	23,571	24,739
1976-77	839	7,128	58,046	66,013	1,683	2,635	4,318
1975-76	261	6,741	32,723	39,725	2,170	2,380	4,550
1974-75	427	7,318	56,396	64,141	1,333	4,255	5,588
1973-74	2,694	6,366	79,587	88,878	1,772	5,613	7,385
1972-73	4,596	8,776	100,587	113,959	1,706	7,702	9,408
1971-72	---	---	---	---	2,050	2,513	4,563
Average	3,220	57,548	108,425	170,562	2,523	8,281	10,931

1. Includes the influence of treated wastewater discharged to the Los Angeles River from the Los Angeles-Glendale Water Reclamation Plant (as of WY 1976-77) and the Donald C. Tillman Water Reclamation Plant (as of September 1985).
2. Gage F-57-C, the major measurement point of discharge to the Los Angeles River, is estimated beginning with the 2010-11 Water Year through March 2014 due to measurement inaccuracies and/or disruptions. Installation of new equipment and measurement practices by LACFCD at Gage F-57C-R increased reliability of the measurements to the satisfaction of the Watermaster.
3. Includes the influence of declining capacity at Verdugo Park Treatment Plant.
4. Includes the influence of dry weather runoff and perennial stream flow.

2.4 GROUNDWATER RECHARGE

Precipitation has a direct influence on groundwater recharge and, ultimately, on the amount of groundwater in storage in the four ULARA groundwater basins. Urban development in ULARA over time has resulted in a significant portion of the rainfall being collected and routed into storm drains and/or lined channels that discharge directly into the Los Angeles River. To partially offset the increased runoff due to urbanization, Pacoima, Big Tujunga and Hansen dams, which had originally been constructed for flood control purposes, are now being utilized to regulate storm flows and to allow for recapture of a portion of the flows and releases to existing downstream spreading basins operated by the LACDPW and the City of Los Angeles in the northeastern portion of the SFB.

The LACDPW operates the Branford, Hansen, Lopez, and Pacoima spreading grounds. The LACDPW, in cooperation with the City of Los Angeles, operates the Tujunga spreading grounds. These spreading grounds are primarily used for the artificial recharge of native water (stormwater runoff). Table 2-4 summarizes the spreading operations at all spreading basins in the SFB for the current WY, whereas Table 2-5 summarizes the estimates of the resulting recharge since the 1968-69 WY. Plate 1A shows the locations of these spreading grounds.

A summary table of existing distributed stormwater capture projects within ULARA is presented in Appendix F. Included on this table are estimates prepared by each Party of the annual volume of stormwater captured by each project listed therein.

Table 2-4 SPREADING OPERATIONS IN THE SAN FERNANDO BASIN

Agency	Spreading Facility	2017 OCT	2017 NOV	2017 DEC	2018 JAN	2018 FEB	2018 MAR	2018 APR	2018 MAY	2018 JUN	2018 JUL	2018 AUG	2018 SEP	TOTAL
		(acre-feet)												
LACDPW														
	Branford	4	4	4	108	9	175	3	3	3	5	4	4	326
	Hansen	8	14	26	102	41	255	115	42	4	9	0	0	616
	Lopez [1]	0	445	847	1	0	0	0	0	0	0	0	0	1,293
	Pacoima [1]	3,190	1,980	1,970	285	0	1,010	0	0	348	231	0	0	9,014
	Tujunga	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**3,202**	**2,443**	**2,847**	**496**	**50**	**1,440**	**118**	**45**	**355**	**245**	**4**	**4**	**11,249**
City of Los Angeles														
	Tujunga [2]	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Basin Total		**3,202**	**2,443**	**2,847**	**496**	**50**	**1,440**	**118**	**45**	**355**	**245**	**4**	**4**	**11,249**
City of Burbank [1]		3,081	2,320	2,694	0	0	0	0	0	0	0	0	0	**8,095**

1. MWD water imported by Burbank & spread at Pacoima and/or Lopez Spreading Grounds is accounted for in the totals reported by LACDPW; the separate "City of Burbank" total reported below the "Basin Total" is for information purposes, and should not be added to the "Basin Total" as it is already accounted for. Burbank began spreading MWD water in the 2009-10 Water Year following completion of the Burbank MWD connection.
2. This water is derived from backwashing of the Tujunga GAC vessels and discharged into Tujunga spreading basin.

Note: The Headworks Spreading Basins no longer exist and have been removed from this table.

Table 2-5 ANNUAL SPREADING OPERATIONS IN THE SAN FERNANDO BASIN

Water Year	Los Angeles County Department of Public Works (Native + Imported[1]) (acre-feet)						City of Los Angeles (Imported) (acre-feet)			GRAND TOTAL (acre-feet)	City of Burbank (Imported)[1]	Rainfall (inches)
	Branford	Hansen	Lopez	Pacoima	Tujunga	TOTAL	Headworks	Tujunga	TOTAL		Pacoima (acre-feet)	Weighted Average Valley/Mtns.
2017-18	326	616	1,293	9,014	0	11,249	0	0	0	11,249	8,095	8.53
2016-17	469	12,824	4,178	16,341	0	33,812	0	0	0	33,812	11,791	21.41
2015-16	547	1,137	42	1,298	523	3,548	0	0	0	3,548	306	10.05
2014-15	529	922	1	1,254	268	2,974	0	1	1	2,975	150	12.68
2013-14	474	1,667	661	7,442	195	10,439	0	4	4	10,443	7,000	7.98
2012-13	570	1,758	501	7,015	927	10,771	0	11	11	10,782	6,703	8.72
2011-12	529	9,357	104	3,482	101	13,573	0	4	4	13,577	1,371	11.55
2010-11	690	19,064	3,922	24,164	31,476	79,316	0	4	4	79,320	11,187	25.21
2009-10	535	16,766	274	9,080	12,849	39,504	0	7,509	7,509	47,013	34	20.55
2008-09	706	0	1	2,000	7,233	9,940	0	0	0	9,940	---	12.58
2007-08	570	10,517	634	5,025	4,892	21,638	0	0	0	21,638	---	17.27
2006-07	532	5,762	44	436	1,200	7,974	0	0	0	7,974	---	5.36
2005-06	576	20,840	958	7,346	14,895	44,615	0	0	0	44,615	---	17.42
2004-05	1,448	33,301	940	17,394	21,115	74,198	0	0	0	74,198	---	45.66
2003-04	444	6,424	144	1,731	1,322	10,065	0	0	0	10,065	---	12.21
2002-03	932	9,427	518	3,539	1,914	16,330	0	0	0	16,330	---	21.22
2001-02	460	1,342	0	761	101	2,664	0	0	0	2,664	---	6.64
2000-01	562	11,694	172	3,826	1,685	17,939	0	0	0	17,939	---	22.29
1999-00	468	7,487	578	2,909	2,664	14,106	0	0	0	14,106	---	16.77
1998-99	547	8,949	536	696	3,934	14,662	0	0	0	14,662	---	10.83
1997-98	641	28,129	378	20,714	11,180	61,042	0	77	77	61,119	---	38.51
1996-97	415	9,808	724	5,768	6,406	23,121	0	51	51	23,172	---	17.65
1995-96	345	8,232	363	4,532	7,767	21,239	0	0	0	21,239	---	14.48
1994-95	585	35,137	1,086	14,064	18,236	69,108	0	0	0	69,108	---	33.08
1993-94	462	12,052	182	3,156	4,129	19,981	0	0	0	19,981	---	11.86
1992-93	389	26,186	1,312	17,001	19,656	64,544	114	0	114	64,658	---	41.26
1991-92	653	15,461	1,094	12,914	9,272	39,394	230	0	230	39,624	---	32.39
1990-91	509	11,489	241	3,940	2,487	18,666	52	0	52	18,718	---	7.69
1989-90	327	2,029	90	1,708	0	4,154	0	0	0	4,154	---	9.55
1988-89	255	3,844	308	1,306	0	5,713	0	0	0	5,713	---	9.72
1987-88	352	17,252	1,037	4,520	0	23,161	0	0	0	23,161	---	21.36
1986-87	0	7,311	141	467	0	7,919	0	33	33	7,952	---	7.70
1985-86	290	18,188	1,735	6,704	0	26,917	0	1,433	1,433	28,350	---	23.27
1984-85	244	13,274	104	3,375	0	16,997	0	5,496	5,496	22,493	---	13.31
1983-84	213	10,410	0	3,545	0	14,168	0	24,115	24,115	38,283	---	11.18
1982-83	883	35,192	1,051	22,972	10,580	70,678	10	32,237	32,247	102,925	---	46.07
1981-82	345	14,317	243	5,495	0	20,400	3,853	0	3,853	24,253	---	20.16
1980-81	245	14,470	335	3,169	0	18,219	4,652	9,020	13,672	31,891	---	12.89
1979-80	397	31,087	1,097	15,583	0	48,164	5,448	19,931	25,379	73,543	---	33.66
1978-79	295	24,697	1,018	12,036	0	38,046	2,463	31,945	34,408	72,454	---	24.07
1977-78	2,142	28,123	445	20,472	12,821	64,003	3,200	18,247	21,447	85,450	---	44.84
1976-77	377	2,656	63	1,943	0	5,039	3,142	16	3,158	8,197	---	16.02
1975-76	470	3,128	562	1,308	0	5,468	3,837	5,500	9,337	14,805	---	14.20
1974-75	681	5,423	915	2,476	0	9,495	4,070	9,221	13,291	22,786	---	---
1973-74	672	6,287	946	2,378	0	10,283	6,205	0	6,205	16,488	---	---
1972-73	1,271	9,272	0	6,343	2,274	19,160	5,182	0	5,182	24,342	---	---
1971-72	161	1,932	0	1,113	0	3,206	7,389	0	7,389	10,595	---	---
1970-71	507	11,657	727	4,049	0	16,940	6,804	399	7,203	24,143	---	---
1969-70	674	11,927	0	1,577	2,380	16,558	11,021	0	11,021	27,579	---	---
1968-69	461	32,464	893	14,262	13,052	61,132	6,698	3,676	10,374	71,506	---	---
AVG.	548	12,871	639	6,829	4,644	25,530	1,518	3,448	4,965	30,496	4,818	

1. Spreading by Burbank began in 2009-10 Water Year following completion of the Burbank MWD connection. These volumes are reported by LACDPW spreading data and are therefore included in the "Grand Total" column.

2.5 GROUNDWATER EXTRACTIONS

The original Trial Court adjudication of groundwater rights in ULARA, effective October 1, 1968, restricted all groundwater extractions to a total combined maximum safe yield value of approximately 104,040 AFY for all four ULARA groundwater basins. This value amounted to a reduction of approximately 50,000 AF from the average annual groundwater extractions by all Parties from these basins for the six years prior to 1968. The State Supreme Court's opinion, as implemented on remand in the Final Judgment of January 26, 1979, further restricted total groundwater pumping from each groundwater basin, and by each Party within each basin.

A summary of groundwater extractions from each ULARA basin is summarized on Table 2-11, Table 2-12, Table 2-13, and Table 2-14 for the San Fernando Basin, Sylmar Basin, Verdugo Basin, and Eagle Rock Basin, respectively. Extraction rights for the San Fernando Basin and the Sylmar Basin are shown on Table 2-15 and Table 2-16, respectively. The Groundwater Extractions Report provided in Appendix A summarizes the groundwater extractions by each Party during the current water year, whereas Plates 1A through 1D show the general locations of the various wellfields owned by the five municipal-supply Parties in ULARA.

Table 2-6 summarizes private party pumping in the SFB for the current water year.

Table 2-6 PRIVATE PARTY PUMPING – SAN FERNANDO BASIN

2017-18 Water Year
(acre-feet)

Nonconsumptive Use or Minimal Consumption	
Sears, Roebuck and Company (Air Conditioning; well disconnected 2000)	---
Sportsmens' Lodge	4.42
Toluca Lake Property Owners	8.99
Vulcan (CalMat) [1] (Gravel washing)	1,363.35
Walt Disney Productions (3 wells inactive/ Not abandoned)	---
Total	**1,376.76**

Groundwater Dewatering	
Charged to Los Angeles' water rights	
Avalon Encino	---
BFI Sunshine Canyon Landfill	98.93
First Financial Plaza Site	5.66
Mercedes Benz of Encino	0.13
Metropolitan Transportation Agency	28.57
Metropolitan Water District	85.00
Trillium Corporation	24.63
Warner Properties Plaza 6 and 3	8.67
Total	**251.59**

Groundwater Cleanup	
Charged to Burbank's water rights	
B.F.Goodrich (Menasco/Coltec)	0.00
Home Depot U.S.A. Inc.	0.00
Subtotal	*0.00*
Charged to Los Angeles' water rights	
3M-Pharmaceutical	19.95
Boeing Santa Susana Field Lab	0.00
Honeywell International, Inc.	195.54
Micro Matics USA, Inc.	---
Tesoro	---
Subtotal	*215.49*
Total	**215.49**

Physical Solution	
Charged to Burbank's water rights	
Valhalla Memorial Park	0.00
Subtotal	*0.00*
Charged to Glendale's water rights	
Forest Lawn Cemetery Assn.	488.42
Subtotal	*488.42*
Charged to Los Angeles' water rights	
Hallelujah Prayer Ctr (Hathaway/deMille)	1.68
Middle Ranch (deMille)	0.00
Toluca Lake Property Owners	30.00
Water Licenses	1.09
Wildlife Waystation	1.20
Debra and Donald Cecil	0.09
RJ's Property Management	8.00
Subtotal	*42.06*
Total	**530.48**

Total Extractions **2,374.32**

1. Water pumped by Vulcan (Calmat) excludes an estimated 360.62 AF of water lost through evaporation.
2. Middle Ranch Well Nos. 6 & 7 were sold to Debra L. Cecil and Donald R. Cecil, effective February 2017.
3. Middle Ranch Well Nos. 5 & 8, and Springs 1 & 2, were sold to RJ's Property Management, effective February 2017.
4. Middle Ranch Well Nos. 3 & 4 were sold to RJ's Property Management, effective September 2018.

2.6 IMPORTS AND EXPORTS OF WATER

The continued growth of residential, commercial, and industrial developments has required that more water be imported to supplement the availability of local groundwater supplies in ULARA over time. Imported supplies to ULARA are from the Los Angeles Aqueduct (LAA) and from MWD. Imported water from the LAA consists of runoff from the Eastern Sierra Nevada and groundwater from Owens Valley. The imported MWD supplies consist of State Water Project and water from the Colorado River Aqueduct.

Exports from ULARA include water imported from the LAA and from MWD (pass-through water), and groundwater extracted from the SFB by LADWP. Exports of wastewater not treated and released into the Los Angeles River are delivered via pipeline to the Hyperion Treatment Plant in the Playa Del Rey area of the City of Los Angeles (outside of ULARA, to the south).

Table 2-7 summarizes the imports and exports from ULARA during the 2016-17 and 2017-18 WYs. Constraints on water supply sources available to the City of Los Angeles from the Eastern Sierra Nevada and Owens Valley have reduced the amounts of water from these sources that can be imported into ULARA; however, the Parties have tried to manage this water supply challenge, in part, by enacting water conservation measures to help reduce the total overall water demand in ULARA.

Table 2-7 ULARA WATER IMPORTS AND EXPORTS

Source and Agency	Water Year (acre-feet) 2016-17	2017-18
Gross Imported Water		
Los Angeles Aqueduct		
City of Los Angeles	284,836	288,843
MWD Water		
City of Burbank [1]	17,509	14,300
Crescenta Valley Water District	2,175	2,243
City of Glendale	14,428	16,391
City of Los Angeles	121,580	147,021
La Canada Irrigation District [2]	956	1,052
Las Virgenes Municipal Water District [2]	7,001	7,584
City of San Fernando	0	0
MWD Total	**163,649**	**188,591**
Grand Total	**448,485**	**477,434**
Exported Water (Pass-Through)		
Los Angeles Aqueduct		
City of Los Angeles	150,341	134,769
MWD Water		
City of Los Angeles	72,732	74,853
Total	**223,073**	**209,622**
Net Imported Water	**225,412**	**267,812**

1. Total includes water imported for potable use and for groundwater replenishment (spreading).
2. Deliveries to those portions of these agency's service areas that are within ULARA.

2.7 RECYCLED WATER

Recycled water currently provides an additional source of water for irrigation, industrial, and recreational uses. In the future, wastewater recycling should be able to provide additional water for groundwater recharge at existing and/or new spreading basins, and/or possibly at new aquifer storage and recovery wells (ASR wells, a method to inject water directly into the aquifer systems). Four water reclamation plants (WRPs) are currently in operation in ULARA: the Tillman, Burbank, Los Angeles-Glendale, and the Las Virgenes Municipal Water District plants. Although the latter facility is located west of the southwestern boundary of ULARA, a portion of the water treated at this facility is used in ULARA. Table 2-8 summarizes the operations at these four WRPs in WY 2017-18 and Plate 3 shows the locations of these facilities.

Table 2-8 RECYCLED WATER OPERATIONS

2017-18 Water Year (acre-feet) Plant/Agency	Plant Influent [1]	Effluent to L.A. River	Flow to Hyperion	Recycled Water Use	Recycled Water Use [2] (%)	Recycled Water Delivered to SFB
City of Burbank	6,365	3,548	1,191 [3]	2,997	47%	2,997
Los Angeles-Glendale	19,306 [4]	10,949	2,527	4,753	25%	
Los Angeles				3,271		1,179
Glendale				1,482		1,303
Donald C. Tillman	48,962	28,925	12,700	8,380	17%	3,855
Las Virgenes MWD		0		2,529		2,529
Total	**74,633**	**43,422**	**16,418**	**18,659**		**11,863**

1. Does not include plant overflow/bypass.
2. Recycled water use is calculated as a percentage (%) of plant influent.
3. The volume of sewage exported from Burbank to the City of Los Angeles for treatment at the Los Angeles Hyperion Plant is an estimated quantity, based on the difference between gauged quantities in the system, with adjustments. Additional adjustments are made to account for Sun Valley (Los Angeles) sewage that passes through the Burbank system and other interconnections in accordance with the Los Angeles-Burbank Wastewater Contract. The calculated volumes to Hyperion for some months are negative numbers, and are conjectured to be a result of the Burbank WRP treating more flows received from LA than Burbank discharges to LA. Burbank Public Works is still working with the City of Los Angeles to understand the resultant negative flows calculation.
4. Plant influent is not equal to the effluent due to metering error and/or in-plant use.

2.8 GROUNDWATER ELEVATIONS AND HYDROGRAPHS

The simulated groundwater elevation contour maps for the Spring (April) and the Fall (September) of 2018 for the SFB were created by the ULARA Watermaster Support Staff at LADWP using the SFB Groundwater Flow Model. The SFB model was initially developed during the Remedial Investigation (RI) study of groundwater contamination in the eastern portion of the San Fernando Valley in the early-1990s and was funded through USEPA's Superfund program.

The model is comprised of four hydrostratigraphic layers of varying thicknesses established by others in the deepest portion of the eastern SFB, and includes 6,883 cells, ranging in size from 1,000 by 1,000 feet to 3,000 by 3,000 feet. The model parameters were calibrated by matching the simulated hydraulic-head fluctuations with the historical water level fluctuations measured at selected key monitoring wells for a 10-year period. The simulated contours for SFB were estimated by incorporating the actual monthly recharge (e.g., the amount of spread water, precipitation, etc.) and groundwater extraction values as model inputs to simulate the actual operations in SFB during the period of October 2017 to September 2018. Simulated contours of the equal elevation of groundwater, as modeled by LADWP for April 30, 2018 (Spring 2018) and September 30, 2018 (Fall 2018), were then plotted utilizing groundwater contouring software.

The simulated Groundwater Elevation Contour Maps for Spring and Fall 2018 are shown on Plates 4 and 5, respectively, to depict the regional direction of groundwater flow simulated by the LADWP groundwater model within SFB during these periods. Current groundwater elevations in different portions of the four ULARA groundwater basins may be obtained by submitting a data request; instructions for submitting a data request are available at ULARAwatermaster.com. Additional water level data may also be available from Los Angeles County via http://dpw.lacounty.gov/general/wells/.

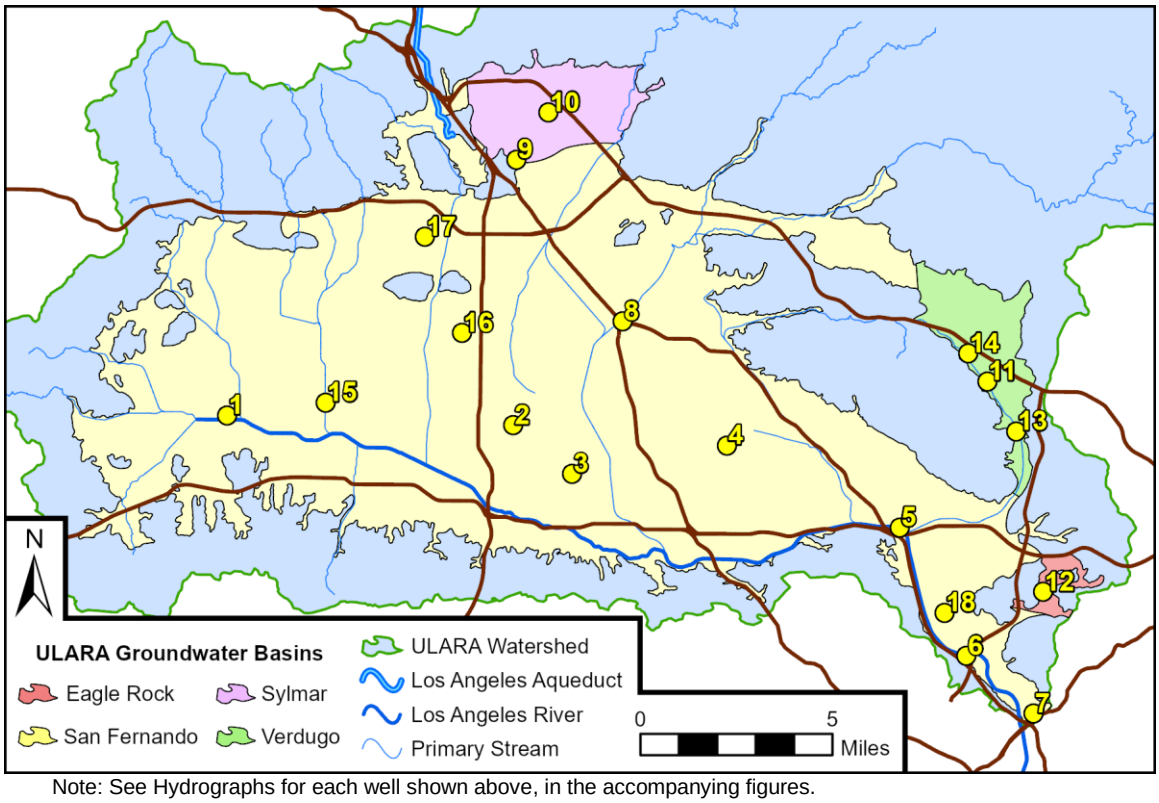
Plate 6 was prepared to illustrate the model-simulated change in groundwater elevations from Fall 2017 to Fall 2018 for the SFB. The simulation shows that groundwater elevations in the region near the Hansen, Pacoima, and Tujunga spreading grounds decreased on the order of about 8 feet in that one-year period. This modest decrease in simulated water levels is mostly attributed to the relatively smaller volume of runoff water that was artificially spread at these spreading grounds compared to that in WY 2016-17. Specifically, the volume of water spread in WY 2017-18 at the Pacoima spreading grounds was approximately 12,200 AF less than that in WY 2016-17. Spreading at the Hansen spreading grounds in WY 2017-18 was also lower by approximately 7,300 AF, relative to

the volume spread in the Hansen spreading grounds in WY 2016-17. No water was spread in the Tujunga spreading grounds in WY 2017-18 due to ongoing construction activities within these grounds.

Groundwater elevations near the LADWP-owned Rinaldi-Toluca wellfield were simulated to decrease by 2 feet, and around the North Hollywood wellfields groundwater elevations were simulated to increase by approximately 4 feet. These changes are attributed to the increase in the volume pumped from the Rinaldi-Toluca wellfield and the reduced volume of pumping by the North Hollywood wellfield.

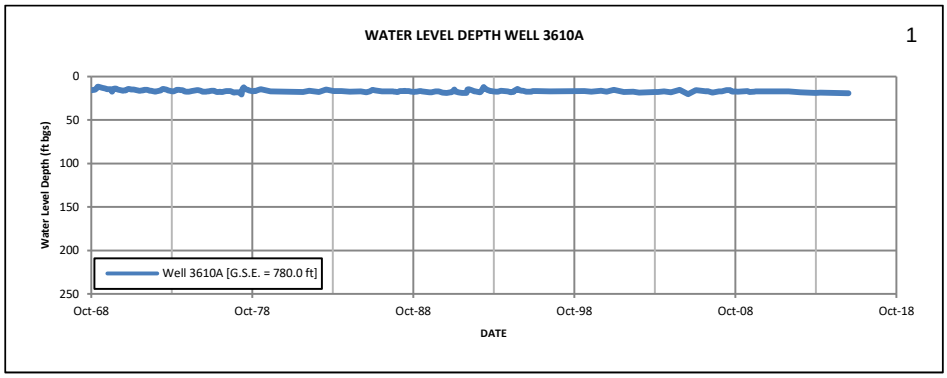
Water level data from 18 water level observation wells within the valley fill areas of ULARA continue to be monitored on a regular basis by LADWP and LACDPW. Water level records for these observation wells were used to create hydrographs (graphs of water levels versus time) for this Annual Watermaster Report. Figure 2-3 illustrates the locations of these 18 observation wells for which hydrographs were prepared, whereas the hydrographs for these 18 wells are shown on Figure 2-4A through Figure 2-4D. The graphs illustrate the fluctuations in water levels in those wells on a seasonal basis for each year and also on a year-to-year basis in response to variations in seasonal/annual groundwater extractions and annual recharge. Actual water levels for each well are plotted on the hydrographs as depth to water for each available data point; the ground surface elevation (GSE) of each well is also listed on each respective hydrograph.

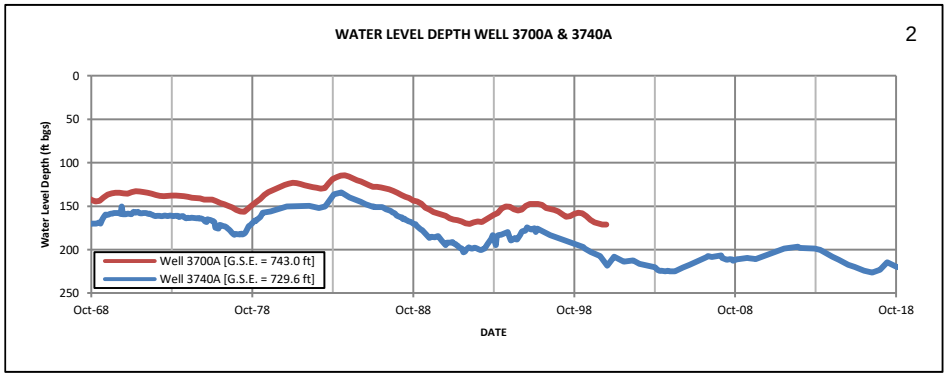
Figure 2-3 LOCATIONS OF WELLS WITH HYDROGRAPHS

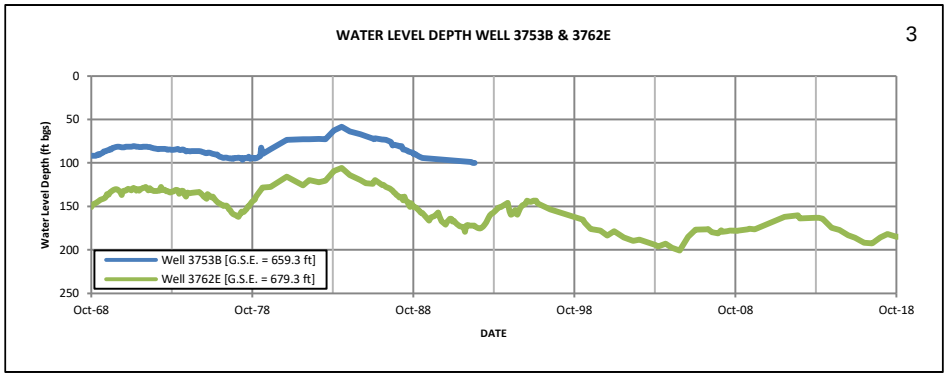


Note: See Hydrographs for each well shown above, in the accompanying figures.

Figure 2-4A SAN FERNANDO BASIN HYDROGRAPHS







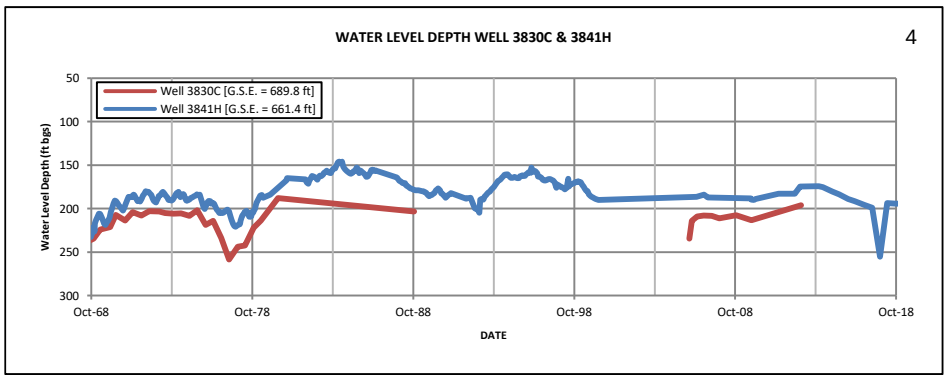
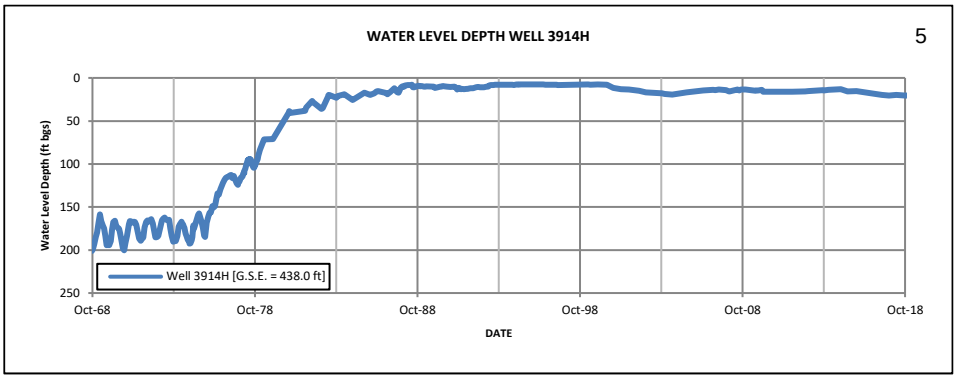
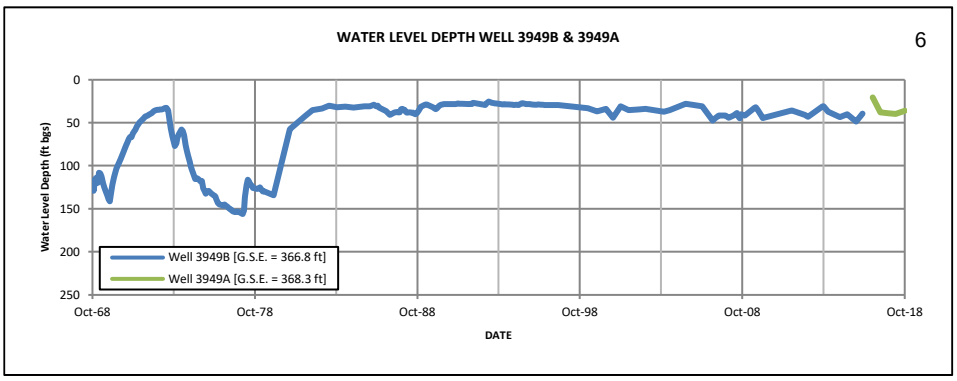
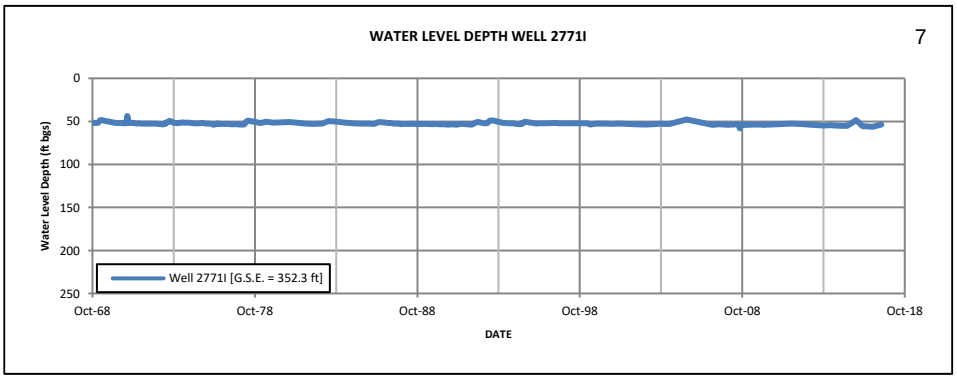


Figure 2-4A SAN FERNANDO BASIN HYDROGRAPHS, CONT'D







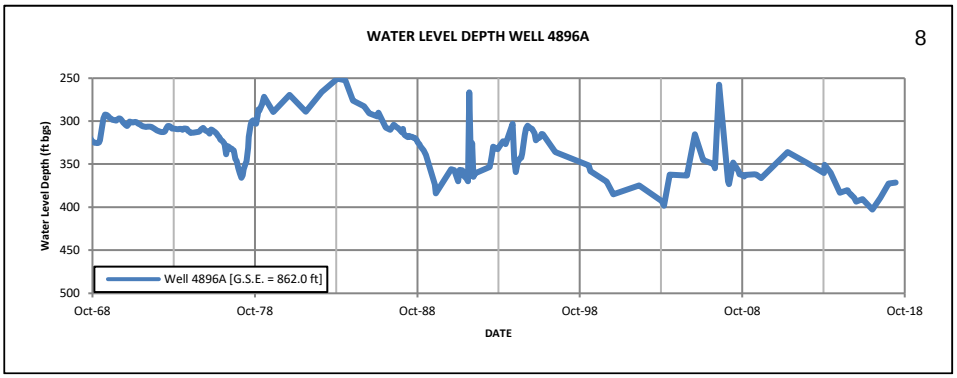
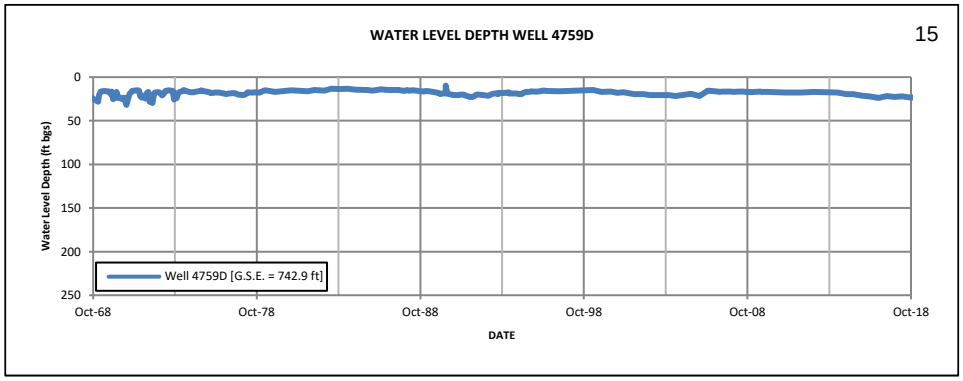
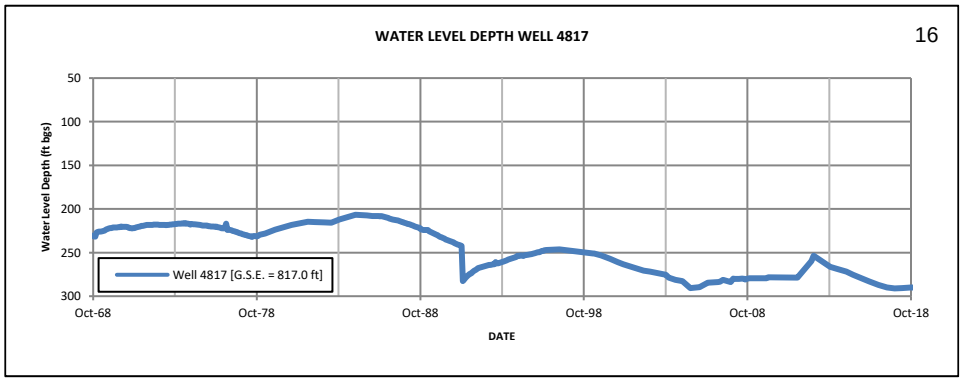
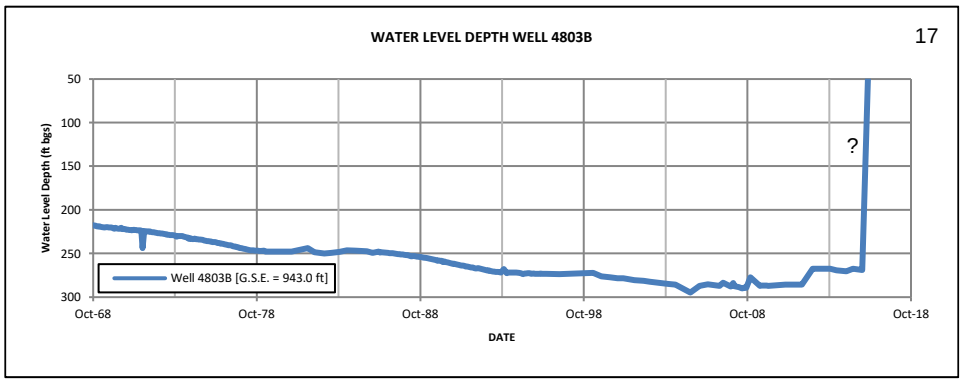


Figure 2-4A SAN FERNANDO BASIN HYDROGRAPHS, CONT'D







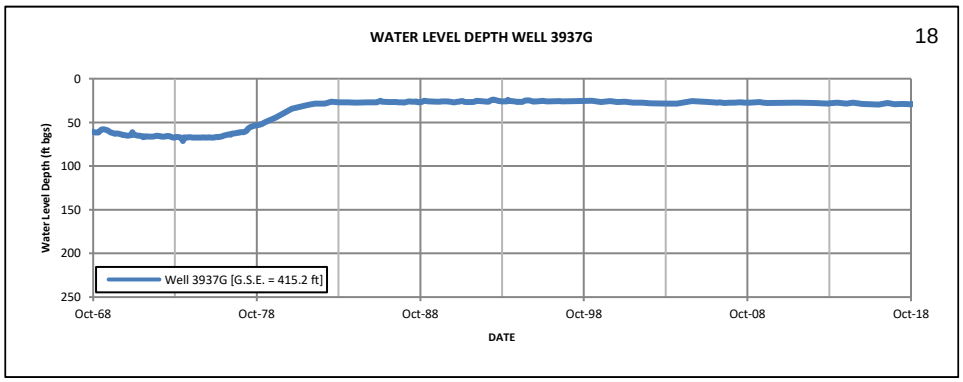
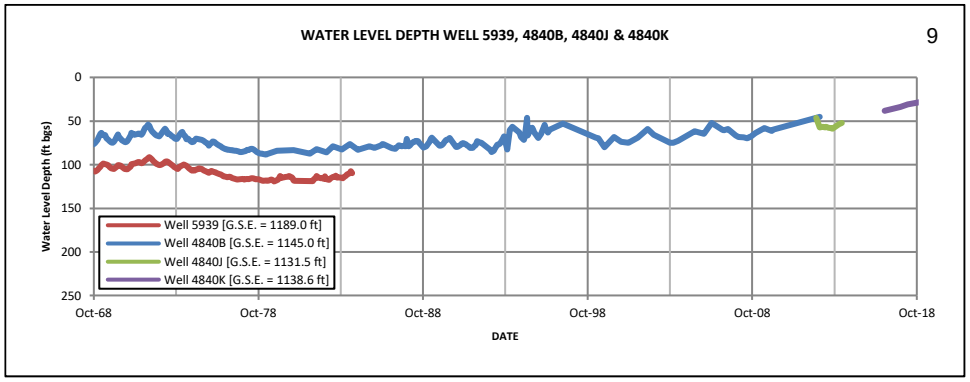


Figure 2-4B SYLMAR BASIN HYDROGRAPHS



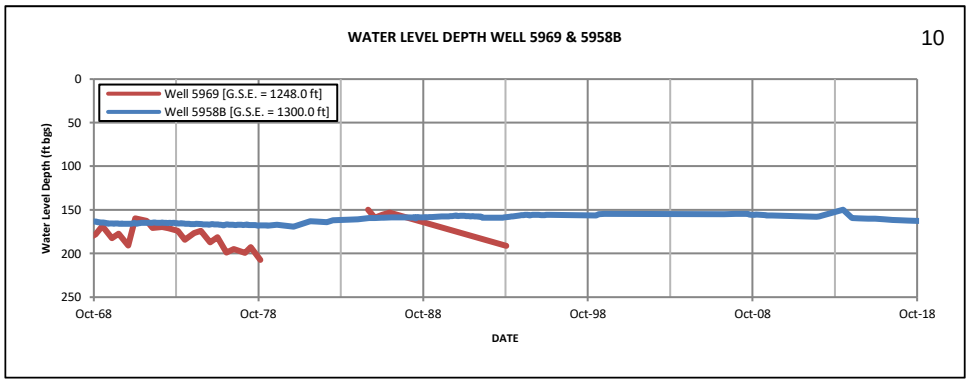
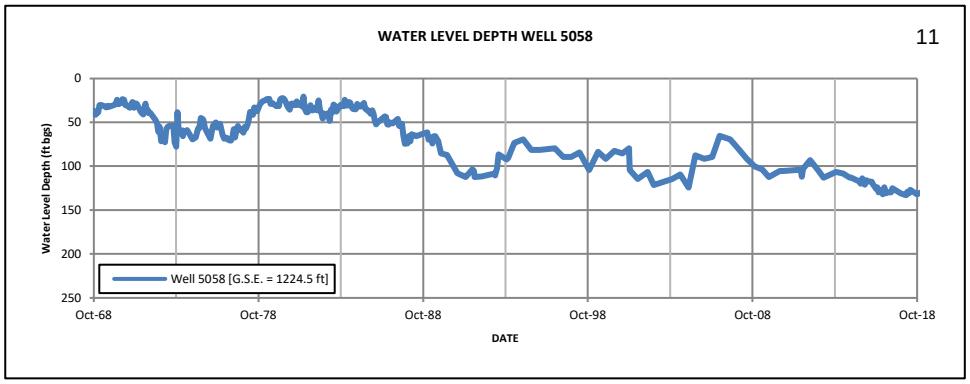
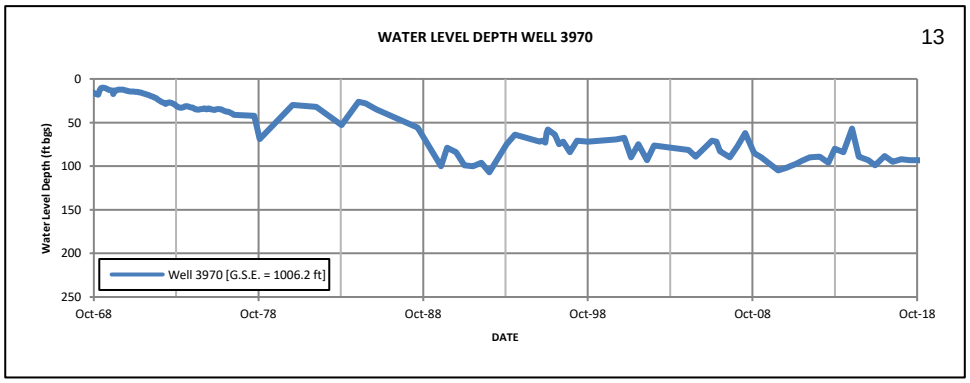


Figure 2-4C VERDUGO BASIN HYDROGRAPHS





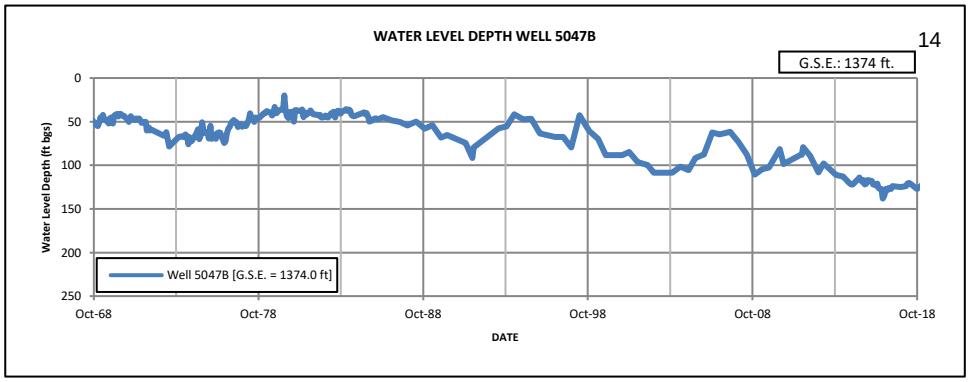
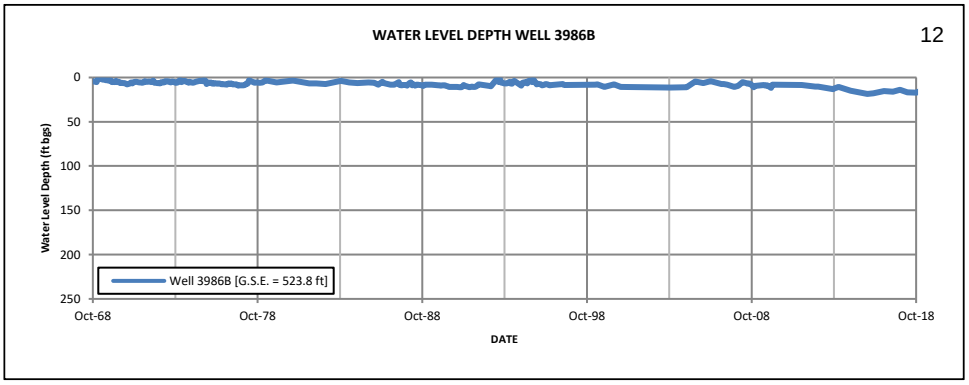


Figure 2-4D EAGLE ROCK BASIN HYDROGRAPH



2.9 GROUNDWATER IN STORAGE

2.9.1 San Fernando Basin

The change in the amount of groundwater stored in the SFB is evaluated each year in three ways: between the current water year and the previous water year; for the cumulative change since Safe Yield Operation began in 1968; and for the cumulative change since 1928, the date at which sufficiently detailed records are considered to have become available for the original safe yield calculations.

In Fall 1968, following the Trial Court decision, Safe Yield Operation was implemented by the Court in an effort to halt the overdraft of the SFB that had begun in 1954 (refer to the blue-colored line on Plate 7). Methodology established by the State Water Rights Board, also referenced in Appendix R of the 1962 Report of Referee, was used to derive a regulatory requirement for groundwater in storage of 360,000 AF for the SFB that considered normal wet-dry cycles, operational flexibility, and annual pumping based on the calculated safe yield. The upper regulatory storage limit of 210,000 AF above the 1954 storage volume was established to help prevent excess rising groundwater from leaving the basin, whereas the lower regulatory storage limit of 150,000 AF below the 1954 storage level was established to help provide additional storage space for groundwater in wet years. It was determined that the amount of stored groundwater should be kept between the upper and lower limits of the regulatory storage range (indicated on Plate 7 by the two horizontal-dashed red lines). As shown on Plate 7, and with only a few brief exceptions, the SFB has rarely been operated within this regulatory storage range after 1968.

Plate 7 illustrates the estimated change in groundwater storage within the SFB by the blue line, and in tabular form on Table 2-9. Each year, groundwater levels are measured in numerous wells throughout the SFB. These groundwater levels are used to calculate the overall increase or decrease in volume of groundwater stored in this basin; the resulting change in storage is plotted on Plate 7 on an annual basis. The blue line on Plate 7 depicts the fluctuations over time in the calculated change in groundwater storage, beginning in approximately 1980; the very slight, but overall declining trend from 1980 to the present has occasionally been reversed during years of above-average rainfall and/or years of above-average spreading operations, and/or periods of decreased groundwater extractions. The long-term decline in groundwater in storage depicted on Plate 7 has been caused by a greater volume of water leaving the SFB than has been recharged on a long-term average annual basis. Causes of this decline include: pumping in excess of long-

term recharge; reduced natural recharge caused by increased urbanization and runoff leaving the basin; additional amounts of groundwater underflow and rising groundwater leaving the basin; reductions in irrigation return-flow recharge due to reductions in irrigation water use as a result of water conservation efforts in the region; and reductions in the volumes of artificial recharge due to restrictions at the spreading grounds located in the northeastern portion of SFB.

Fortunately, in recent years, the City of Los Angeles (through LADWP) and the LACDPW have been working together to seismically retrofit and/or enlarge the reservoir capacity of certain dams and to rehabilitate and/or enlarge the existing spreading basins in the eastern portion of ULARA; refer to Chapter 1 of this report for additional details. These projects were oriented, in part, to capture and store additional amounts of surface water runoff in the eastern portion of the SFB. Those agencies are also considering additional plans, such as optimizing the methods and/or timing for operating those reservoirs and spreading basins to further enhance recharge opportunities. Programs already completed and/or currently in progress between those two agencies and the annual volume of increased recharge at each facility in the SFB are shown on Table 2-10.

Table 2-9 shows a summary of the change in storage in the SFB over time, including the change in storage for the current water year as well as the cumulative total change in storage since 1968. The volume of groundwater in storage in SFB is estimated to have decreased during the current water year. This decrease in storage is attributed to below-average rainfall in the region, decreased stormwater spreading volumes compared to prior years, and similar groundwater production in the basin during the current water year compared to that in the prior water year. Based on those changes in storage calculations, the remaining storage space available in the SFB is illustrated on Plate 7. This available space can be used to capture and store additional native water or imported water supplies during wet (above-average rainfall) years. Basin storage space is a valuable resource; it has been the opinion of all ULARA Watermasters that this storage space should be available for use by the Parties.

2.9.2 Sylmar Basin

The groundwater storage capacity of the Sylmar Basin was previously calculated by others to be approximately 310,000 AF. The volume of groundwater in storage in this basin is estimated to have increased by 3,994 AF during the current water year.

2.9.3 Verdugo Basin

The groundwater storage capacity of the Verdugo Basin, as previously determined by others, is approximately 160,000 AF. The volume of groundwater in storage in this basin is estimated to have increased by 4,487 AF during the current water year.

2.9.4 Eagle Rock Basin

The volume of groundwater in storage in ERB is estimated to have decreased by 92 AF during the current water year.

2.10 WATER SUPPLY AND DISPOSAL - BASIN SUMMARIES

Table 2-11, Table 2-12, Table 2-13, and Table 2-14 summarize water supply and disposal activities in the San Fernando, Sylmar, Verdugo, and Eagle Rock groundwater basins, respectively. Outflows from these basins are based on computations originally made by the State Water Rights Board in the 1962 Report of Referee.

Table 2-9 CHANGE IN GROUNDWATER IN STORAGE IN SFB

Water Year	Valley Floor Precipitation (in)	Artificial Recharge (acre-feet)	Change in Storage (acre-feet)	Cumulative Change in Storage (acre-feet)	Groundwater Extractions (acre-feet)
2017-18	7.14	11,249	(7,479)	60,817	56,844
2016-17	18.43	33,812	16,567	68,296	55,481
2015-16	8.53	3,548	(43,179)	51,729	92,126
2014-15	10.79	2,973	(39,722)	94,908	91,896
2013-14	6.23	10,621	(59,010)	134,630	99,672
2012-13	7.71	10,780	(12,157)	193,640	73,710
2011-12	10.81	14,944	(10,338)	205,797	69,764
2010-11	24.44	90,502	71,081	216,135	64,313
2009-10	19.08	47,013	17,856	145,054	80,487
2008-09	11.64	9,940	(15,750)	127,198	72,140
2007-08	15.10	21,638	9,443	142,948	67,228
2006-07	4.39	7,974	(33,693)	133,505	94,430
2005-06	16.46	44,615	16,303	167,198	59,375
2004-05	42.64	74,198	66,476	150,895	67,865
2003-04	9.52	10,065	(22,367)	84,419	89,346
2002-03	19.41	16,330	(15,835)	106,786	95,431
2001-02	5.95	2,664	(27,094)	122,621	87,992
2000-01	19.52	17,939	(6,930)	149,715	86,946
1999-00	14.84	14,106	(31,044)	156,645	116,357
1998-99	9.81	14,662	(82,673)	187,689	141,757
1997-98	37.04	61,119	44,113	270,362	94,682
1996-97	15.17	23,172	(35,737)	226,249	105,899
1995-96	12.03	21,239	(49,223)	261,986	82,862
1994-95	33.36	69,108	79,132	311,209	58,121
1993-94	10.19	19,981	(22,238)	232,077	62,990
1992-93	36.62	64,658	106,317	254,315	36,419
1991-92	30.05	39,624	411	147,998	76,213
1990-91	14.38	18,718	(14,122)	147,587	71,065
1989-90	8.20	4,154	(29,941)	161,709	81,466
1988-89	9.12	5,713	(30,550)	191,650	127,973
1987-88	18.62	23,161	(5,000)	222,200	105,470
1986-87	5.99	7,952	(31,940)	227,200	91,632
1985-86	20.27	28,350	(7,980)	259,140	86,904
1984-85	11.00	22,493	(31,690)	267,120	101,591
1983-84	9.97	38,283	(63,180)	298,810	115,611
1982-83	39.64	102,925	121,090	361,990	68,394
1981-82	17.18	24,253	(530)	240,900	84,682
1980-81	11.04	31,891	(32,560)	241,430	92,791
1979-80	30.25	73,543	99,970	273,990	58,915
1978-79	21.76	72,454	78,080	174,020	59,843
1977-78	35.43	85,450	136,150	95,940	66,314
1976-77	14.19	8,197	(50,490)	(40,210)	125,445
1975-76	9.90	14,805	(30,090)	10,280	103,740
1974-75	14.74	22,786	(22,580)	40,370	95,830
1973-74	15.75	16,488	(21,820)	62,950	88,017
1972-73	20.65	24,342	17,020	84,770	82,004
1971-72	8.10	10,595	(17,090)	67,750	84,140
1970-71	15.57	24,143	15,340	84,840	79,010
1969-70	10.50	27,579	(9,740)	69,500	88,856
1968-69	29.00	71,506	79,240	79,240 [1]	84,186
50 Year Average	**16.96**	**30,365**	**1,216**	**-----**	**84,484**

1. Accumulation of Storage calculation commenced as of October 1, 1968.

Table 2-10 PROJECTS TO ENHANCE RECHARGE CAPACITY IN THE SFB

Project	LADWP's Project Partner	Construction Start Date	Construction End Date	Expected Increase in Recharge (AFY)
Sheldon-Arleta Project	LASAN	2007	Completed Nov 2009	4,000
Big Tujunga Dam Seismic Retrofit Project	LACFD	2007	Completed Feb 2012	4,500
Hansen Spreading Grounds Enhancement Project	LACFCD	2008	Completed Jan 2013	2,100
Woodman Ave. Stormwater Capture Project	LASAN	2012	Completed Feb 2014	55
Laurel Canyon Blvd. Green Street Project	LASAN	2016	2016	40
Burbank Blvd. BMP Project	LABOE	2021	2023	53
Sun Valley EDA Public Improvement Project	LABOE	2015	Completed March 2016	93
Lopez Spreading Grounds Enhancement Project	LACFCD	2024	2024	480
Tujunga Spreading Grounds Enhancement Project	LACFCD	2016	2021	8,000
Pacoima Spreading Grounds Enhancement Project	LACFCD	2021	2023	5,300
Whitnall Highway Stormwater Capture Project	LASAN	2022	2023	270
Branford Spreading Basin Enhancement Project	LACFCD	2022	2024	597
Rory M. Shaw Wetlands Park Project	LACFCD	2021	2028	590
San Fernando Valley Distributed Projects	LASAN	2018	2021	469
Big Tujunga Dam Sediment Removal Project	LACFCD	2022	2026	To Be Determined
Pacoima Dam Sediment Removal Project	LACFCD	2024	2028	700

1. The future construction start and end dates and the expected increase in recharge listed in the chart are estimated and subject to change.

Table 2-11 SUMMARY OF WATER SUPPLY & DISPOSAL - SAN FERNANDO BASIN

2017-18 Water Year	(acre-feet)					
Water Source and Use	City of Burbank	City of Glendale	City of Los Angeles	City of San Fernando	All Others	Total
Extractions						
Municipal Use	10,408	7,435	36,627	---	0	54,470
Basin Account	---	---	---	---	0	0
Physical Solution	---	---	---	---	530 [1]	530
Cleanup/Dewaterers	---	---	---	---	467	467
Non-consumptive Use	---	---	---	---	1,377	1,377
Total	**10,408**	**7,435**	**36,627**	**0**	**2,374**	**56,844**
Imports						
LA Aqueduct Water	---	---	288,843	---	---	288,843
MWD Water	6,205 [2]	16,391	131,500	0	7,584 [3]	161,680
Groundwater from						
Sylmar Basin	---	---	0	2,635	---	2,635
Verdugo Basin	---	0	---	---	---	0
Total	**6,205**	**16,391**	**420,343**	**2,635**	**7,584**	**453,158**
Delivered Recycled Water [4]	2,997	1,303	5,034 [5]	0	2,529 [3]	11,863
Exports						
LA Aqueduct Water						
out of ULARA	---	---	129,229	---	---	129,229
to Verdugo Basin	---	---	401	---	---	401
to Sylmar Basin	---	---	6,216	---	---	6,216
to Eagle Rock Basin	---	---	6,388	---	---	6,388
MWD Water						
out of ULARA	---	---	59,100	---	---	59,100
to Verdugo Basin	---	2,437	183	---	---	2,620
to Sylmar Basin	---	---	2,830	---	---	2,830
to Eagle Rock Basin	---	---	2,642	---	---	2,642
Groundwater	17 [6]	665 [6]	30,575	---	---	31,257
Total	**17**	**3,102**	**237,564**	**0**	**0**	**240,683**
Delivered Water						
Hill & Mountain Areas	---	---	45,497	---	---	45,497
Total - All Areas	19,593	22,027	224,440	2,635	12,487	281,182
Water Outflow						
Storm Runoff (F-57C-R)	---	---	---	---	31,860	31,860
Rising Groundwater (F-57C-R)	---	---	---	---	1,701	1,701
Subsurface	---	---	---	---	391	391
Recycled Water to the LA River	3,548	3,414	36,460	---	0 [3]	43,422
Wastewater to Hyperion	1,191 [7]	788 [8]	14,439 [8]	---	---	16,418

1. Includes pumping from Hill and Mountain areas tributary to SFB.
2. Does not include water imported for groundwater replenishment (spreading).
3. Las Virgenes Municipal Water District (LVMWD); recycled water delivered primarily to the hill and mountain areas.
4. Referred to as “Reclaimed Water” in previous reports.
5. LA total recycled water is 11,651 AF of which 5,034 AF were delivered to valley fill and 6,617 AF were delivered to the hill and mountain areas and for other industrial uses.
6. Groundwater treated at the Glendale OU and Burbank OU is discharged to the Los Angeles River or the sewer.
7. The volume of sewage exported from Burbank to the City of Los Angeles for treatment at the Los Angeles Hyperion Plant is an estimated quantity, based on the difference between gauged quantities in the system, with adjustments. Additional adjustments are made to account for Sun Valley (Los Angeles) sewage that passes through the Burbank system and other interconnections in accordance with the Los Angeles-Burbank Wastewater Contract. The calculated volumes to Hyperion for some months are negative numbers, and are conjectured to be a result of the Burbank WRP treating more flows received from LA than Burbank discharges to LA. Burbank Public Works is still working with the City of Los Angeles to understand the resultant negative flows calculation.
8. Water discharged from Tillman and LAG WRPs. Volume assigned to each City from LAG WRP is derived from the proportion of the total recycled water delivered to each City.

Table 2-12 SUMMARY OF WATER SUPPLY & DISPOSAL - SYLMAR BASIN

2017-18 Water Year	(acre-feet)			
Water Source and Use	**City of Los Angeles**	**City of San Fernando**	**All Others**	**Total**
Total Extractions	0	2,896	0 [1]	2,896
Imports				
LA Aqueduct Water from SFB	6,216	--	--	6,216
MWD Water	--	0	--	0
MWD Water from SFB	2,830	0	--	2,830
Total	**9,046**	**0**	**0**	**9,046**
Exports - Groundwater				
to San Fernando Basin	0	2,635	0	2,635
Total Delivered Water	9,046	261	0	9,307
Water Outflow				
Storm Runoff	5,000 [2]	--	--	5,000
Subsurface	560 [3]	--	--	560
Total	**5,560**	**0**	**0**	**5,560**

1. Pumping for landscape irrigation by Santiago Estates. The well was capped in 1999.
2. Surface outflow is not measured. Estimate based on Mr. F. Laverty – SF Exhibits 57 and 64.
3. Estimated in the Report of Referee, and later revised by the Watermaster.

Table 2-13 SUMMARY WATER SUPPLY & DISPOSAL - VERDUGO BASIN

2017-18 Water Year	(acre-feet)					
Water Source and Use	**Crescenta Valley Water District**	**City of Glendale**	**La Canada Irrigation District**	**City of Los Angeles**	**Other**	**Total**
Total Extractions	1,426	1,167 [1]	---	---	11 [2]	2,604
Imports						
LA Aqueduct Water from SFB	---	---	---	401		401
MWD Water	2,243	2,437	1,052			5,732
MWD Water from SFB				183		183
Total	2,243	2,437	1,052	584		6,316
Exports						
San Fernando Basin	0	0	0	0		0
CVWD	---	0	0	0		0
Total	0	0	0	0		0
Delivered Recycled Water [3]		178		0		178
Total Delivered Water	3,669	3,782	1,052	584	11	9,098
Water Outflow						
Storm Runoff (Sta. F-252) [4]					4,396	4,396
Rising Groundwater (Sta. F-252)					2,230	2,230
Subsurface to:						
Monk Hill Basin	---	---	---	---	300 [5]	300
San Fernando Basin	---	---	---	---	80 [5]	80
Total	**0**	**0**	**0**	**0**	**7,006**	**7,006**

1. City of Glendale Total Extractions includes Rockhaven Well (CVWD 16) extractions.
2. Private party extractions.
3. Referred to as “Reclaimed Water” in previous reports.
4. Includes rising groundwater.
5. Estimated in the Report of Referee.

Table 2-14 SUMMARY OF WATER SUPPLY & DISPOSAL - EAGLE ROCK BASIN

2017-18 Water Year	(acre-feet)		
Water Source and Use	City of Los Angeles	DS Waters	Total
Total Extractions	0	180 [1]	180
Imports			
LA Aqueduct Water from SFB	6,388	--	6,388
MWD Water (LA35) [2] from SFB	2,642		2,642
MWD Water (LA17) [2]	15,521		15,521
Groundwater from SFB [3]	0	--	0
Total	**24,551**	**0**	**24,551**
Exports			
LA Aqueduct Water out of ULARA	5,540		5,540
MWD Water (LA35) [2] out of ULARA	2,291		2,291
MWD Water (LA17) [2] out of ULARA	13,462		13,462
Groundwater	0	180	180
Total	**21,293**	**180**	**21,473**
Total Delivered Water	3,258	0	3,258
Water Outflow			
Storm Runoff	--	--	--
Subsurface	50 [4]	--	50
Total	**50**	**0**	**50**

1. DS Waters (formed by the merger of Suntory/Deep Rock Water Co. and McKesson/Danone Water Products) is allowed to pump as successor to Deep Rock and Sparkletts, under a stipulated agreement with the City of Los Angeles, and are allowed to export equivalent amounts.
2. LA35 and LA17 are connections between the MWD and LADWP water systems where MWD imported water is supplied to the City of Los Angeles.
3. Groundwater meter flow data is unavailable due to metering issues.
4. Estimated in Supplement No. 2 to Report of Referee (1962).

2.11 EXTRACTION RIGHTS AND STORED WATER CREDITS

2.11.1 San Fernando Basin

Table 2-15 shows the calculation of extraction rights for the forthcoming water year in SFB, and Table 2-17 shows the Stored Water Credits for the cities of Burbank, Glendale, and Los Angeles. All rights are based on the Final Judgment dated January 26, 1979 and the "Interim Agreement for the Preservation of the San Fernando Basin Water Supply, 2008" (document available at ULARAwatermaster.com).

In December 2017 the 10-year Stipulated Agreement entitled "Interim Agreement for the Preservation of the San Fernando Basin Water Supply" ("Agreement") expired. With the expiration of the Agreement, the annual deduction of 1% of the calculated Stored Water Credits is no longer imposed. Table 2-17 has been adjusted from prior annual reports to reflect the removal of that calculation.

2.11.2 Sylmar Basin

Table 2-16 shows the calculation of Sylmar Basin extraction rights for the forthcoming water year. Table 2-18 and Table 2-19 display the Stored Water Credits for the cities of Los Angeles and San Fernando. These rights are based on the March 22, 1984 Stipulation between the City of San Fernando and the City of Los Angeles, and the action by the Administrative Committee on July 16, 1996 to temporarily increase the safe yield of this basin from 6,210 AFY to 6,510 AFY. That 1996 temporary increase expired on October 1, 2005, but the safe yield was re-evaluated by the then-Watermaster in 2006. Another stipulation was prepared by the then-Watermaster on December 13, 2006, and this increased the safe yield of the Sylmar Basin to 6,810 AFY (effective October 1, 2006), subject to certain conditions that provided the basis for these water rights.

In July 2012, the current Watermaster prepared a new re-assessment of the safe yield of this basin titled "Final Report – Sylmar Basin Safe Yield, 5-Year Re-assessment". The resulting document was filed with the Court in June 2013; a copy of this document is available via ULARAwatermaster.com. In the 2012 re-assessment, the Watermaster temporarily and conditionally increased the total safe yield of Sylmar Basin from 6,810 AFY to 7,140 AFY. In October 31, 2016, the Watermaster extended the new and larger 2012 value for the subsequent five water years. Each of the above-listed reassessments of the safe yield of Sylmar Basin was performed using the same basic methodology originally devised by the first ULARA Watermaster, Mr. Melvin Blevins.

In addition to the increase in the safe yield value, the groundwater credit calculation for Sylmar Basin previously used by the two former ULARA Watermasters had to be revised by the current Watermaster as part of his work for the July 2012 safe yield re-assessment. Specifically, groundwater credits in Sylmar Basin are now being calculated by the current Watermaster directly according to the Judgment; that is, credits can no longer be carried over for more than 5 years (Judgment, January 26, 1979; Subsection 5.2.2.3, p. 19-20). Table 2-19 shows the revised method of groundwater credit calculation for Sylmar Basin.

To address the potential loss of credits accumulated over time via the method of credit calculation utilized in the past by the former Watermasters, and as described in the July 2012 re-evaluation report (see ULARAwatermaster.com), each Party will remain credited with "frozen" groundwater credits (9,014 AF and 404 AF for the City of Los Angeles and the City of San Fernando, respectively); the initial accounting of these "frozen credits" is shown on Table 2-18. Both Parties will be able to exercise their right to use those accumulated, but now, "frozen" groundwater credits. However, neither city will be able to exercise its 5-year credits (shown on Table 2-19), even if they do not or cannot pump their new safe yield value, until such time as their individual, newly "frozen" credits are used entirely. Note that, at any time, either Party may permanently abandon its "frozen" credits and begin accessing its stored water credits accrued via the 5-year credit calculation method.

2.11.3 Verdugo Basin

Glendale and CVWD have rights to extract 3,856 and 3,294 AFY, respectively, from this basin. The City of Los Angeles has a right to extract its Import Return water in the Verdugo Basin, but has never exercised this right. No Stored Water Credits are currently permitted by the Judgment in the Verdugo Basin for any party.

2.11.4 Eagle Rock

The City of Los Angeles has the right to extract, or cause to be extracted, the entire safe yield of this basin. This safe yield consists mostly of return flows of delivered water by the City of Los Angeles. Neither this City, nor any other Parties, pump groundwater from the Eagle Rock Basin. DS Waters, as successor to the Sparkletts and the Deep Rock water companies, has a physical solution right to extract groundwater to supply its bottled drinking water facility in this basin.

Table 2-15 CALCULATION OF EXTRACTION RIGHTS – SAN FERNANDO BASIN

	(acre-feet)		
	City of Burbank	**City of Glendale**	**City of Los Angeles**
Total Delivered Water, WY2017-18	19,593	22,027	224,440
Water Delivered to Hill and Mountain Areas, WY2017-18	---	---	45,497
Water Delivered to Valley Fill, WY2017-18	19,593	22,027	178,943
Percent Recharge Credit	20.0%	20.0%	20.8%
Return Water Extraction Right	3,919	4,405	37,220
Native Safe Yield Credit	---	---	43,660
Annual Extraction Right for the 2018-19 Water Year[1]	**3,919**	**4,405**	**80,880**

1. Does not include Stored Water Credit and Physical Solution.

Table 2-16 CALCULATION OF EXTRACTION RIGHTS - SYLMAR BASIN

	(acre-feet)		
	City of Los Angeles	**City of San Fernando**	**All Others**
Annual Extraction Right for the 2018-19 Water Year[1]	3,570	3,570	--- [2]

1. Does not include Stored Water Credit. The safe yield of the Sylmar Basin was increased to 7,140 AFY effective October 1, 2012. Effective October 1, 1984 safe yield less pumping by Santiago Estates is equally shared by the cities of Los Angeles and San Fernando.
2. Santiago Estates (Home Owners Group) capped its well in 1999.

Table 2-17 CALCULATION OF STORED WATER CREDITS – SAN FERNANDO BASIN

Item Number and Description	(acre-feet) City of Burbank	City of Glendale	City of Los Angeles
1. Stored Water Credit (as of Oct. 1, 2017)	19,824	28,959	554,500
1a. Credits and Debits	30 [1]	0	(30) [1]
1b. Prior Year Adjustments	0	(58) [2]	58 [2]
2. Extraction Right for the 2017-18 Water Year	3,657	4,237	74,068
3. WY2017-18 Extractions			
Party Extractions	10,408	7,435	36,627
Physical Solution Extractions	0	488	42
Clean-up/Dewaterers	0	0	467
Total	10,408	7,923	37,136
4. Spread Water 2017-18 Water Year	8,095	0	0
5. Stored Water Credits [3] per City (as of Oct. 1, 2018)	21,198	25,215	591,460

1. In the current WY, the City of Los Angeles received 30 AF of disinfected tertiary treated denitrified Title 22 compliant recycled water from Burbank in exchange for and equal volume of groundwater credits.
2. Stored water credit exchange between the cities of Glendale and Los Angeles for groundwater pumping at Los Angeles County Waterworks District No. 21, Kagel Canyon in WY 2016-17.
3. Item 5 = 1 +1a + 1b + 2 – 3 + 4.

Table 2-18 CALCULATION OF "FROZEN" STORED WATER CREDITS - SYLMAR BASIN

	(acre-feet)	
	City of Los Angeles	City of San Fernando
1. "Frozen" Water Credit (as of Oct. 1, 2017)	9,014	404
2. Extraction Right for the 2017-18 Water Year [1]	3,570	3,570
3. Total 2017-18 Extractions	0	2,896
Santiago Estates[2]	0.0	0.0
4. Total Extractions Less Extraction Right (= Item 3 - Item 2)	(3,570)	(674)
5. Remaining "Frozen" Water Credits[3] (as of Oct. 1, 2018)	**9,014**	**404**

1. The total safe yield of the Sylmar Basin was increased to 7,140 AFY as of October 1, 2012.
2. Santiago Estates pumping is subtracted equally from the rights of the cities of San Fernando and Los Angeles. Santiago Estates capped its well in 1999.
3. If Item 4 > 0, then Item 4 is deducted from "Frozen" Water Credits, otherwise, "Frozen" Water Credits remain unchanged. Per the Sylmar Basin Safe Yield re-evaluation, "Frozen" Stored Water Credits no longer accumulate, and can only be consumed (See 2012-dated Sylmar Safe Yield Evaluation available at ULARAwatermaster.com).

Table 2-19 CALC. OF STORED WATER CREDITS - 5-YEAR METHOD - SYLMAR BASIN

Party	Water Year	Annual Extraction Right (AF)	Total Extractions (AF)	Credits Consumed Due to Previous Year Overpumpage	Annual Volume of Accrued Credits (AF)	Remarks
City of Los Angeles	2013-14	3,570	668	0	2,902	Total extraction was less than annual extraction right.
	2014-15	3,570	0	0	3,570	Total extraction was less than annual extraction right.
	2015-16	3,570	683	0	2,887	Total extraction was less than annual extraction right.
	2016-17	3,570	0	0	3,570	Total extraction was less than annual extraction right.
	2017-18	3,570	0	0	3,570	Total extraction was less than annual extraction right.
			STORED WATER CREDITS (as of Oct. 1, 2018) =		**16,499**	
City of San Fernando	2013-14	3,570	3,352	0	218	Total extraction was less than annual extraction right.
	2014-15	3,570	2,736	0	834	Total extraction was less than annual extraction right.
	2015-16	3,570	3,008	0	562	Total extraction was less than annual extraction right.
	2016-17	3,570	2,777	0	793	Total extraction was less than annual extraction right.
	2017-18	3,570	2,896	0	674	Total extraction was less than annual extraction right.
			STORED WATER CREDITS (as of Oct. 1, 2018) =		**3,081**	

1. Note: Stored water credits in Table 2-19 are calculated by summing the "Annual Volume of Accrued Credits" column and subtracting the sum of the "Credits Consumed due to Previous Year Overpumpage" column.

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3 WATER QUALITY, TREATMENT, AND REMEDIAL INVESTIGATIONS

3.1 WATER QUALITY BY SOURCE

Various water sources are used within ULARA as described below. A representative summary of the total dissolved solids (TDS) concentrations and the general water quality character analyses of imported water, surface water and groundwater are provided in Appendix D.

3.1.1 Imported Water

Sources of imported water and their basic water character in ULARA are as follows

1. *LOS ANGELES AQUEDUCT* water has a sodium bicarbonate character and is the highest quality water available to ULARA.
2. *COLORADO RIVER* water is predominantly sodium-calcium sulfate in character, but the quality of this water supply changes to a sodium sulfate character after it has been treated to reduce total hardness.
3. *NORTHERN CALIFORNIA* Water (delivered via the State Water Project) is sodium bicarbonate-sulfate in character. It generally contains lower concentrations of TDS and is softer than either local groundwater or imported Colorado River water.
4. *COLORADO RIVER/NORTHERN CALIFORNIA* waters were first blended at the Weymouth Plant in mid-1975. Blending ratios vary over time depending on the availability of supply and area demands.

3.1.2 Surface Water

Surface runoff contains salts dissolved from the erosion of sediments and rocks in the tributary areas of ULARA and is considered to generally display a sodium-calcium to sulfate-bicarbonate water character.

3.1.3 Groundwater

Groundwater in ULARA is considered to be moderately hard to very hard. The character of groundwater from the major water-bearing formations is of two general types, each reflecting the composition of the sediments and the surface runoff in each area. In the

western part of the SFB, the groundwater is generally calcium sulfate-bicarbonate in character, whereas in the eastern part of SFB (and also in the Sylmar and Verdugo basins), groundwater generally displays a calcium bicarbonate character.

The overall quality of the groundwater in ULARA is generally within the recommended limits of the California Title 22 Drinking Water Standards, except for:

- areas in the eastern SFB which display high concentrations of certain VOCs like trichloroethene (TCE) and tetrachloroethene (PCE), along with hexavalent chromium (CrVI), nitrate (NO_3), and 1,4-dioxane;
- areas in the western portion of the SFB which tend to have high concentrations of naturally-occurring sulfate and TDS;
- areas within the Verdugo Basin that have shown elevated concentrations of nitrate (NO_3);
- areas within the Sylmar Basin that have elevated concentrations of nitrate and certain VOCs.

Wherever the local groundwater is pumped, it is being treated or blended to meet State Drinking Water Standards, or the impacted wells in each specific basin have been temporarily removed from active service.

3.2 SALT AND NUTRIENT MANAGEMENT PLAN DEVELOPMENT

The State Water Resources Control Board (SWRCB) adopted a Recycled Water Policy in February 2009. That Policy required that Salt and Nutrient Management Plans (SNMP) be developed for groundwater basins in the state to "facilitate basin-wide management of salts and nutrients from all sources in a manner that optimizes recycled water use while ensuring protection of groundwater supply and beneficial uses, agricultural beneficial uses, and human health." In accordance with the Recycled Water Policy, a SNMP is being developed for the four ULARA groundwater basins by the ULARA Watermaster.

Development of the SNMP for the ULARA groundwater basins is ongoing. The ULARA Watermaster continues to work closely with RWQCB-LA staff and the ULARA stakeholders as part of the SNMP development. As of December 2017, five technical memoranda (TM's) have been prepared. During the 2016-17 Water Year, the ULARA SNMP Technical Committee met on a monthly basis through May 2017, when TM-5 was completed.

A public information meeting regarding the ongoing SNMP development was held on July 13, 2017. The basic purpose of the meeting was to provide a summary of the ULARA SNMP to interested parties and stakeholders, with a focus on the results of the mixing model developed as part of the SNMP work. A public CEQA Scoping meeting regarding the ongoing SNMP development was held on October 17, 2017. Development of the CEQA documentation is also ongoing. Preparation of the necessary CEQA environmental documentation process is ongoing, and the Watermaster has been working with RWQCB-LA and ESA to move the documentation forward. ESA, the CEQA subcontractor, is working to finalize the documentation.

Each of the TM's developed for the ULARA SNMP can be accessed through the ULARA Watermaster website via ULARAwatermaster.com/SNMP. In addition, information presented and distributed at various ULARA SNMP meetings are also available for download from the website, including those meetings mentioned above that were held during WY 2017-18. Important dates and updates regarding the ongoing development of the SNMP for ULARA will be distributed periodically via the website throughout the SNMP development process.

3.3 PRIVATE SEWAGE DISPOSAL SYSTEMS (PSDS)

To reduce the potential for groundwater contamination from septic tanks in the City of Los Angeles, the City enacted Ordinance No. 160388, Los Angeles Municipal Code Section 64.26 (LAMC Section 64.26) on September 17, 1985. This ordinance is entitled "Mandatory Abandonment of Private Sewage Disposal Systems (PSDS)."

LAMC Section 64.26 requires all owners of industrial, commercial, and multiple dwelling residential (five or more units) properties to connect to the public sewer, when the sewer becomes available, and to discontinue use of their PSDS within one year of the date of the issuance of a "Notice to Connect" by the City of Los Angeles. LAMC Section 64.26 also requires the Director of the Bureau of Sanitation (Director) to issue a "Reminder Notice" and a "Final Notice to Connect" to the owner of the property four (4) months and one (1) month, respectively, prior to the compliance deadlines. LAMC Section 64.26 further requires the Director to take the following actions whenever a property is found to be in violation of the Code requirements:

- Request LADWP to discontinue water service to the subject property;

- Request the Superintendent of Buildings to order any building(s) on the subject property to be vacated; and
- Request the City Attorney to take the necessary legal action(s) against the property owner.

During WY 2017-18, Industrial Waste Management Division (IWMD) did not report to the ULARA Watermaster that they had received any referrals from the Financial Management Division and Wastewater Engineering Services Division to investigate properties and determine the applicability of the provisions of LAMC 64.26.

The City of Los Angeles is continuously looking for areas to add sewer and encourages owners of PSDS to properly abandon their septic systems and connect to sewer. Additionally, this City is seeking grant funding opportunities to implement septic-to-sewer projects to encourage residents to properly abandon their onsite wastewater treatment systems (OWTS) and connect to the public sewer. Plate 8 shows the locations of proposed sewer improvement projects in the City of Los Angeles. Additional Information regarding the City of Los Angeles's efforts to reduce PSDS and OWTS sites can be found at their website, as follows:

https://www.lacitysan.org/san/faces/home/portal/s-lsh-wwd/s-lsh-wwd-cw/s-lsh-wwd-cw-ssps?_adf.ctrl-state=1cyuj3unrg_4&_afrLoop=13296318219627425#.

3.4 LANDFILLS

There are active and closed landfills throughout the ULARA, as shown on Plate 9, that may have impacted, or have the potential to impact, the quality of surface water and groundwater in ULARA. In 1987, the California Water Code was amended to include Section 13273, requiring the SWRCB to develop a ranked list of all known landfills throughout the state on the basis of each landfill's threat to water quality. Section 13273 also required the operator of each solid waste disposal site on the ranked list to submit to the appropriate RWQCB the results of a groundwater assessment, referred to as a solid waste water quality assessment test (SWAT), to determine if the solid waste disposal site was leaking. The SWAT reports were required on a yearly basis, submitted by rank, beginning with Rank 1 in 1987.

SWAT reports for major SWAT rank (Rank 1 to Rank 4) landfills in the ULARA have all been completed and previously submitted to the RWQCB-LA. The reports that have been

reviewed by the RWQCB-LA are listed in Table 3-1. Further updates to the SWAT reports are triggered by proposals for post-closure land use. The current regulatory status of each site (as determined by the RWQCB-LA) and updated groundwater monitoring data for each landfill site may be found within the SWRCB GeoTracker data system, accessible via http://geotracker.waterboards.ca.gov/.

3.5 SUMMARY OF RECENT ACTIVITIES AT HEWITT PIT LANDFILL

The RWQCB-LA issued a California Water Code (CWC) section 13267 Investigative Order (Investigative Order) to Vulcan Materials Company (Vulcan), the owner of the Hewitt Pit landfill, in January 2014. The Investigative Order required information about historical and current operations and activities at the landfill, and also a proposal for a landfill groundwater monitoring program. In May 2014 Vulcan submitted a report in response to the January 2014 Investigative Order that indicated that the landfill is affecting groundwater quality; the dominant contaminant of potential concern (COPC) was documented to be 1,4-dioxane. Vulcan began quarterly groundwater monitoring in the fourth quarter of 2014 and began implementation of a site assessment work plan in February 2015. The RWQCB-LA issued a Draft Cleanup and Abatement Order (CAO) to Vulcan in May of 2015. Vulcan submitted quarterly groundwater monitoring reports throughout 2015, and site assessment summary reports in May and July 2015; the reports document an evolving understanding of environmental conditions at the landfill that indicate that this landfill is leaking waste constituents (including 1,4-dioxane) to the environment, including groundwater below the site, and included information on the occurrence of landfill leachate not previously encountered in the middle of the eastern portion of the landfill. Vulcan submitted a work plan for additional site assessment, as required by the September 2015 Final CAO, in October 2015. The October 2015 work plan was approved by the RWQCB-LA in November 2015. An interim remedial action plan prepared by Golder Associates was submitted in April 2016 to the RWQCB-LA. Following review and comments of that document by the RWQCB-LA and other stakeholders, including LADWP, an amended interim action plan was approved by the RWQCB-LA in February 2018. In August 2018, RWQCB-LA requested that PFAS (Per- and polyfluoroalkyl substances) sampling and analysis be voluntarily performed.

In addition, USEPA reached a settlement with Vulcan requiring the company to design several extraction wells and a treatment system for 1,4-dioxane in the groundwater beneath its property. The design is scheduled to be completed in 2019.

Updated information for this site can be found at the RWCQCB GeoTracker website: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T10000004448.

Table 3-1 LANDFILLS WITH SWAT INVESTIGATION

Name	Rank	Current Owner	Location	SWAT Report Completed	Final SWAT Submitted	Phase II SWAT Req.	Approved by RWQCB
Open							
CalMat (Sun Valley #3)	2	CalMat Properties	Sun Valley District, NE of Glenoaks Blvd	Jul-88	Nov-90		Jun-92
Scholl Canyon	1	City of Glendale	San Rafael Hills, 1 mile West of Rose Bowl	Jul-87	Apr-88		Aug-90
Stough Park	2	City of Burbank	Bel Air Drive & Cambridge Drive	Jun-88	Dec-88		Apr-90
Sunshine Cyn. LA City/LA County	2	Browning - Ferris Industries	SE Santa Susana Mtns W of Golden State Fwy	Jul-88	Jul-89		Apr-94
Closed							
Bradley East	2	WMDSC	SE of Sheldon St	Jun-87	Nov-90		Apr-92
Bradley West	1	WMDSC	Sun Valley, SE of Sheldon St.	Jun-87	Nov-90		Apr-92
Bradley West Extension	3	WMDSC	Near Canyon Blvd & Sheldon St	Jul-88	Jul-89		Apr-92
Branford	2	City of Los Angeles Bureau of Sanitation	Sun Valley District, NW of Tujunga Wash	Jul-88	Oct-90	X	Jun-92
Gregg Pit/Bentz	2	CalMat Properties	Between Pendleton St & Tujunga Ave	Jul-89	Jul-89		Feb-90
Hewitt Pit	2	CalMat Properties	North Hollywood District Hollywood Fwy, Laurel	Jun-88	Jul-89		May-91
Lopez Canyon	2	City of Los Angeles Bureau of Sanitation	N of Hansen Dam near Lopez and Kagel Cyn	Jun-88	Jun-88	X	
Newberry	3	Los Angeles (LA By-Products Co.)	N of Strathern St, Tujunga Ave	Jun-88	Jul-89		Sep-89
Pendleton St.	4	City of Los Angeles Bureau of Sanitation	Sun Valley, Pendelton St & Glenoaks Blvd	Jul-90	May-91		Jun-92
Penrose	2	Los Angeles (LA By-Products Co.)	N of Strathern St, Tujunga Ave	Jun-88	Jul-89		Sep-89
Scholl Canyon	2	City of Glendale	San Rafael Hills, 1 mile West of Rose Bowl	Jul-87	Aug-90		Dec-93
Sheldon-Arleta	1	City of Los Angeles Bureau of Sanitation	Sun Valley District near Hollywood & Golden State Fwys	May-87	May-87		Feb-90
Sunshine Cyn. LA City	2	Browning - Ferris Industries	SE Santa Susana Mtns W of Golden State Fwy	Jul-88	Jul-89		Apr-94
Toyon Canyon	2	City of Los Angeles Bureau of Sanitation	Griffith Park	Jun-88	Mar-89		Apr-91
Tuxford Pit	2	Aadlin Bros. (LA By-Products Co.)	Sun Valley District, SW of Golden State Fwy & Tujunga Ave	Jun-88	Dec-90		Jun-92
Incomplete							
Strathern		Never completed. Application 12/88.	Strathern St. & Tujunga Ave				

1. Additional information including the historic landfill use, ongoing monitoring, leak information, etc, can be found at the SWRCB GeoTracker data system, accessible via http://geotracker.waterboards.ca.gov/.

3.6 WATER TREATMENT

3.6.1 USEPA Operable Units - SFB

USEPA is proceeding with enforcement actions against PRPs as part of their overall, long-term groundwater remediation activities in the SFB. Below is a brief summary of the various USEPA Operable Units (OUs) in SFB.

On November 22, 2016, USEPA released the San Fernando Valley Superfund Site Community Involvement Plan (CIP). The CIP "organizes USEPA's public participation efforts to actively involve the public in the cleanup decision-making process. It is based on a series of community interviews conducted with local stakeholders and is in accordance with USEPA's cleanup rules and guidance." The CIP can be accessed via the USEPA website: https://semspub.epa.gov/work/09/1162541.pdf.

3.6.1.1 North Hollywood Operable Unit (NHOU)

The North Hollywood Operable Unit (NHOU) began operating in December 1989 in response to elevated concentrations of chlorinated volatile organic compounds (chlorinated VOCs), including trichloroethylene (TCE) and perchloroethylene (PCE). The NHOU operates by pumping groundwater into an aeration tower where the TCE and PCE are removed by an air stripper. Treated water is chlorinated and blended with other sources of clean water before distribution in the public water supply.

More recently, USEPA has detected emerging contaminants in some NHOU wells, including CrVI and 1,4-dioxane. An increase in chromium contamination has caused two of the eight extraction wells in this wellfield to be removed as a source of potable water supply.

In September 2009, USEPA recommended enhanced treatment methods, which included treatment for CrVI and 1,4-dioxane, expanding the combined treatment system, and construction of additional monitoring wells and groundwater extraction wells. In 2015, Lockheed Martin Corporation and Honeywell International, Inc. prepared and submitted a groundwater Modeling Memorandum to USEPA for the design of the Second Interim Remedy for groundwater remediation at the NHOU. The Second Interim Remedy is intended to upgrade and expand the existing NHOU wellfield, and to address treatment of emerging contaminants.

For more information about the NHOU, the USEPA website may be accessed via https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902251.

3.6.1.2 Burbank Operable Unit (BOU)

The BOU, funded by Lockheed-Martin under a USEPA Consent Decree, is owned and operated by the City of Burbank at the expense of Lockheed Martin. This BOU uses air stripping and liquid-phase GAC to remove VOCs from groundwater (local groundwater also contains elevated concentrations of nitrate and chromium), and then blends the treated water with imported water from the MWD for delivery within the City of Burbank.

The City of Burbank is also concerned about CrVI in the groundwater produced by BOU wells and has been blending the pumped groundwater with imported water to keep the concentration of total chromium at or below 7 µg/L; the BOU treatment facility was not designed to treat chromium.

More information about the BOU can be found via the USEPA Website, https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902251.

3.6.1.3 Glendale Operable Unit (GOU)

Construction of the GOU allowed for treated water to be available for delivery in August 2000. The system includes four Glendale North OU extraction wells (with a total pumping capacity of 3,300 gpm) and five Glendale South OU extraction wells (with a total capacity of 2,525 gpm). The new Well GS-5 was completed and began operational pumping in October 2016. The treatment process uses aeration and liquid-phase GAC to treat VOC-contaminated groundwater, weak base anion exchange to remove CrVI from water extracted from Well GN-3, and thereafter the treated water is delivered to the Grandview Basin. The treated water is blended with imported MWD water, as needed, to further reduce the CrVI concentration prior to being delivered to the City's potable water distribution system.

Information from the USEPA can be found via their website at:
https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902252.

3.6.1.4 Glendale Chromium Operable Unit (GCOU)

Established in 2007, the GCOU was created to help characterize the extent of chromium contamination in groundwater in the Glendale area, and to determine appropriate remedial action. USEPA is working with the DTSC and the RWQCB-LA to identify and clean up sources of chromium contamination. Remedial investigation of chromium contamination in groundwater in the GCOU began in 2011. To date, at least 29 groundwater monitoring wells have been constructed to help evaluate the location and extent of the chromium contamination in soils and groundwater beneath the area.

Information for the GCOU are available from the USEPA via: https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902252.

3.6.1.5 Superfund Area 4 - Pollock Wells Treatment Plant (PWTP)

San Fernando Valley (Area 4) is an area of contaminated groundwater covering approximately 5,860 acres near the Pollock Wellfield in the City of Los Angeles. This area is a part of SFB where groundwater is contaminated with various chlorinated VOCs, specifically TCE and PCE.

USEPA completed an interim investigation of the Pollock Wellfield in April 1994 and concluded that selecting and implementing a Superfund remedy for the Pollock area was not immediately necessary because LADWP planned to conduct a wellhead treatment project in its Pollock Wellfield. In March 1999, LADWP reactivated its Pollock wells to extract and treat the groundwater using liquid-phase GAC. The treated water is delivered to LADWP's distribution system for a drinking water end use. Emerging contaminants in the Pollock Wellfield include 1,4-dioxane. LADWP plans to upgrade the existing plant to include treatment for 1,4-dioxane.

USEPA and the California Regional Water Quality Control Board entered into a Cooperative Agreement to perform an investigation of potential sources of contamination in the SFB. USEPA is currently conducting a search for PRPs within the Pollock Site 4 Area, as well as a data gap analysis to identify where additional sampling and site characterization are needed. Following these activities, USEPA will conduct a Remedial Investigation and Feasibility Study to identify the extent of contamination and evaluate clean-up alternatives.

More information about Superfund Area 4 and the Pollock Wells Treatment Plant is available via the USEPA website: https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902253.

3.6.2 Other Treatment Facilities

3.6.2.1 Verdugo Park Water Treatment Plant (VPWTP)

Glendale's VPWTP serves as a filtration and disinfection facility.

3.6.2.2 Glenwood Nitrate Water Treatment Plant

CVWD's Glenwood Nitrate Water Treatment Plant uses an ion-exchange process for nitrate removal. CVWD uses the plant to increase groundwater usage within their service area. The plant was operational during the subject water year.

3.6.2.3 CVWD Well 2 Nitrate Removal Plant

CVWD received a $705,775, Proposition 84, 2015 Integrated Regional Water Management Grant from the California Department of Water Resources (DWR) for the construction of a new Nitrate Removal Treatment System and to re-activate its Well 2 in July 2015. The grant was a 40/60 split, with DWR funding $705,775 and CVWD funding $1,119,225. The proposed Nitrate Removal Treatment System will use the "ARoNite" fixed-film biological process system, which uses a biofilm to reduce nitrate concentrations below the MCL, according to CVWD. Equipment for the project will include a new 150-gpm pump and motor for Well 2, onsite piping, an operations building, electrical and telemetry systems, sewer line for pump-to-waste purposes, and other onsite improvements. The project design was completed in May 2017, construction began in November 2017, and the project was completed in July 2018. CVWD reports that is waiting on approval from DDW to put the system into service.

3.6.2.4 City of San Fernando Nitrate Treatment

The City of San Fernando is in the process of completing the construction of a water treatment plant to address nitrate contamination that affects some of its wells in Sylmar Basin. The plant is expected to be online and operational in 2019.

3.6.2.5 Burbank GAC Treatment Plant

The City of Burbank GAC system (Lake St wells) was shut down in March 2001 because of elevated concentrations of CrVI in the groundwater. Since then, the plant has been used only when necessary to obtain water quality data from the wells and when needed for limited, non-potable power plant use. In WY 2017-18, the GAC Treatment Plant was operated for sampling powerplant use. If the plant is returned to full service in the future, production may be considered as part of the average pumping goal of 9,000 gpm for the Burbank OU.

3.6.2.6 Temporary Tujunga Wellfield Treatment Study Project

The Tujunga Wellfield was constructed in 1992 to produce groundwater from 12 municipal-supply water wells in the SFB. However, certain VOCs, like TCE and PCE, were eventually detected in these wells. Over time, VOC concentrations increased sharply above their respective Federal and State MCLs, requiring the shutdown of multiple wells, and at times the entire wellfield. In 2010, LADWP and MWD completed a wellhead treatment project with the installation of liquid-phase GAC adsorption vessels on two of the most severely impacted wells. The treatment plant is capable of treating a flow rate of 8,000 gpm. Other

constituents of concern in this wellfield include 1,4-dioxane, carbon tetrachloride, and 1,1-dichloroethene (DCE).

Liquid-phase GAC adsorption vessels designed to remove VOCs from groundwater were installed at two wells (Tujunga Well Nos. 6 and 7) and this work has restored more than 20,000 AFY of pumping capacity that was unavailable due to water quality constraints.

In the event either Well No. 6 or No. 7 is taken out of service due to mechanical and/or maintenance needs, groundwater flow should be maintained through the vessels in order to minimize the possibility of bacteriological growth and leaching of metals in the GAC. In response, a backup piping system has been installed to maintain the flow of raw well water from Well No. 8. It is necessary for groundwater pumped by Well No. 8 to supplement flows from either Well No. 6 or 7 in the event of a shut down since neither well can individually provide the minimum flow requirements to operate more than one GAC treatment system.

LADWP is currently in the process of obtaining necessary permits from the Division of Drinking Water (DDW) to operate this connection.

Tujunga Wellfield has been out of service since July 2017 for an electronic control system replacement.

3.7 GROUNDWATER QUALITY INVESTIGATIONS

There are numerous ongoing groundwater quality investigations in ULARA, particularly in the SFB. The reader can obtain current information and more details for the sites mentioned below, which are regulated by the RWCQCB-LA, via that agency's GeoTracker website: http://geotracker.waterboards.ca.gov/.

The DTSC website, http://www.envirostor.dtsc.ca.gov/public/, also contains information regarding groundwater quality investigations and/or cleanup sites within ULARA.

Below are brief descriptions of several groundwater quality investigations for contaminated and/or potentially contaminated sites within ULARA. Note that the discussion below does not provide an exhaustive list of these sites within ULARA. Any omission of a site from the list below does not imply that the omitted site is not important or not of concern to the Watermaster or to the Parties to the Judgment.

3.7.1 DriLube, 711 W. Broadway and 718 W. Wilson, Glendale

DriLube Company, a plating facility located in Glendale, was issued a Cleanup and Abatement Order (CAO) by the RWQCB-LA in 2002. DriLube was named a PRP by USEPA as the source responsible for discharging contaminants from its site into the groundwater affecting the original Glendale South OU. The results of subsurface investigations to date by others have detected chlorinated solvents, petroleum hydrocarbons, polychlorinated bisphenyls (PCBs), and heavy metals (including chromium) within the underlying soils and groundwater.

Although previously managed as a single site, this property was reportedly separated into two addresses (711 W. Broadway and 718 W. Wilson) for cleanup management purposes. USEPA, which previously managed the entire site, returned the 711 W. Broadway site back to the RWQCB-LA in August 2009. The site was determined to have no metals contamination, but rather has been reported to be contaminated only with VOCs. The site was transferred back to USEPA in October 2014 and USEPA will assume lead oversight responsibilities for the ongoing VOC cleanup.

Management of the 718 W. Wilson site remains within the purview of USEPA due to chromium contamination; VOC contamination also exists at the site. In 2010, approximately 460 tons of CrVI-contaminated soils were removed from the site. During this removal work, infrastructure (piping) was installed to facilitate future in-situ remediation of the CrVI. This in-situ treatment will focus on adding amendments to the impacted source soils to reduce CrVI to trivalent chromium.

3.7.2 PRC-DeSoto, 5430 San Fernando Rd, Glendale

The RWQCB-LA issued a Cleanup and Abatement order (CAO) to PRC-DeSoto (formerly Courtaulds Aerospace) in August 2002. This facility has been named a PRP by USEPA as a source for releasing chlorinated organic solvents within the groundwater in the original Glendale South OU; this facility is considered a PRP for the Glendale OU. Historically, the principal industrial activities at the facility involved chemical formulation of adhesives and sealants used by the U.S. Department of Defense for various aerospace applications. Trichloroethane (1,1,1-TCA), dichloroethane (DCA), TCE, PCE, chromium, CrVI, and nickel have been found in the soils and groundwater beneath the facility. Groundwater monitoring continues on a quarterly basis as part of the CAO.

Cleanup operations regarding chromium and VOCs in the soils have reportedly been completed. Work toward closure of the site in regard to soils contamination will begin with

the RWQCB-LA. Work regarding chromium contamination within the local groundwater will be transferred to USEPA. PRC DeSoto has been identified by USEPA as a PRP for the Glendale Chromium OU (GCOU).

3.7.3 Excello Plating, 4057 Goodwin Ave., Los Angeles

The RWQCB-LA issued a CAO to Excello Plating in June, 2003 which was later revised and re-issued in June, 2005. The facility's owners were identified under CERCLA as having responsibility for releasing VOCs, CrVI, nickel, cadmium, zinc, and lead into the subsurface. The basic purpose of this CAO was to ensure that Excello Plating completes the onsite and offsite assessment to help define the lateral and vertical extent of heavy metal contamination (specifically chromium) and, as necessary, undertake remediation. Additionally, USEPA considers this site as a source of the contaminants that impact the GOU.

3.7.4 B.F. Goodrich (fmr. Menasco/Coltec Ind., Inc.) 100 E. Cedar Ave., Burbank

The RWQCB-LA issued a CAO to Coltec Industries, Inc. on July 5, 2002. Through a series of acquisitions, the environmental liability of the facility is now reportedly owned by United Technologies. This facility was identified as a PRP by USEPA as a source of discharging contaminants to the groundwater and affecting the original Glendale North OU (GNOU). Additionally, USEPA has issued a General Notice Letter and a 104E Letter to the site owner(s), and the facility is considered by USEPA to be a PRP for the Glendale Cr OU (GCOU). The former industrial activities at this facility involved machining, manufacturing, metal plating, and anodizing of parts and equipment used by the U.S. Department of Defense for various aerospace applications. VOCs, including TCE, PCE, 1,1-DCE, 1,1,1-TCA, and CrVI, have been detected in the soils and in the groundwater underlying the site.

Continuous soil vapor extraction (SVE) operations were conducted between 1998 and 2004 in an effort to reduce VOC concentrations in the soils beneath the site. The decommissioning of the SVE system was approved by the RWQCB-LA in February 2014. Additionally, both a groundwater extraction system and in-situ bioremediation treatment have been used to further remediate the shallow perched-groundwater zone. The groundwater extraction system was decommissioned in January 2015. The site was purchased by IKEA, Inc in late-2013, and the site was eventually developed into an IKEA furniture retail store in 2017.

3.7.5 ITT/Home Depot, 1200 S. Flower St., Burbank

A few years ago, Home Depot completed construction of its large store and parking lot on the site of this former ITT Aerospace Controls property. By agreement between Home Depot and ITT, Home Depot is responsible for the soil assessment and remediation from ground surface down to the depth of a continuous clay layer that is reported to underlie the property. The contamination in the groundwater beneath the clay layer has been the responsibility of ITT Aerospace Controls, a former parts manufacturer and metal finisher and plater. Groundwater contamination at the site reportedly consists of VOCs, petroleum hydrocarbons, nickel, and CrVI. In 2004, Home Depot constructed a subsurface slurry wall around the site to help prevent lateral migration of the contamination in the shallow groundwater. A naturally-occurring low-permeability zone reportedly located 50 feet below ground surface has been expected by others to reduce vertical migration of the contaminants. Reportedly, ITT is responsible for cleanup of the area below the bottom of the Home Depot's slurry wall barrier. Groundwater monitoring continues on a semi-annual basis; USEPA considers this site to be a source of contamination affecting the GOU.

3.7.6 Honeywell (fmr. Allied Signal/Bendix) 11600 Sherman Way, North Hollywood

Honeywell was issued a CAO on February 21, 2003 and an amended CAO followed in September 2004. The facility was directed to prepare a work plan for additional onsite and offsite subsurface assessment of soil and groundwater. This work plan was submitted and approved, and the field work has been completed. A final report has been submitted and is presently undergoing review by the RWQCB-LA. The facility prepared and submitted a Remedial Action Plan (RAP) for in-situ chromium remediation. The RAP has been approved and is being implemented in conjunction with the facility's General WDR permit. Construction of additional offsite groundwater monitoring wells was approved by USEPA and the RWQCB-LA, and these new monitoring wells have been constructed.

The facility was required to submit a wellhead treatment work plan for treating CrVI and 1,4-dioxane at LADWP's extraction well NHE-2. This well was shut down by LADWP because elevated concentrations of total chromium were detected in the pumped groundwater. Honeywell's work plan was approved along with their short-term remediation plan. Recently, Honeywell submitted its long-term remediation plan for NHE-02 wellhead treatment to the RWQCB-LA for their review and comment/approval. However, the long-term remediation plan was not approved or implemented because Honeywell entered into negotiations with USEPA, LADWP, and CDPH regarding the proposed remediation

approach and its association with USEPA's NHOU interim remedy approach. In January 2013, a second NHOU extraction well (NHE-3) was shut down by LADWP because of elevated concentrations of total chromium and CrVI.

In September 2008, Honeywell began pumping NHE-2 and processing the groundwater through a wellhead treatment system to remove VOCs before discharging the effluent to the sanitary sewer system. Because the VOC and other contaminant concentrations were below the limits identified in the sewer discharge permit, Honeywell was allowed to remove the wellhead treatment system, and to discharge the effluent from NHE-2 directly into the sanitary sewer. Honeywell is currently working with LADWP and CDPH to comply with CDPH Policy Memorandum 97-005 by preparing a Source Water Assessment and Treatment Report. This would recommend construction of a wellhead treatment system to remove VOCs and chromium such that the treated effluent is Title 22 compliant and the groundwater would then be able to be distributed by LADWP.

Honeywell has utilized its consultant (MWH Global, Inc.) in the past few years to site, design and construct 31 groundwater monitoring wells to further characterize the water quality and hydrogeology in the eastern portion of the SFB.

3.7.7 Price Pfister Site, 13500 Paxton St, Pacoima, California

The former Price Pfister site, located at 13500 Paxton Street, was used from the late-1950's to 2002 for manufacturing plumbing fixtures. Manufacturing processes involved casting, machining, and chrome plating. These processes required the use of various cleaning solvents such as PCE, lubricating and cutting oils, and metal plating solutions. Over the years, these chemicals have contaminated the local soils and groundwater.

Since 2002, the RWQCB-LA has been the lead agency overseeing the investigation, monitoring, and remediation of the soil and groundwater contamination at this former Price Pfister site. On March 11, 2009, the RWQCB-LA approved a No Further Action (NFA) for VOCs in soil in all the study areas beneath the site, except for Area 7. The NFA was based on excavation/removal and soil vapor extraction of the VOC-contaminated soil. A significant quantity of soil contaminated with heavy metals (such as CrVI), total petroleum hydrocarbons, and 1,4-dioxane was also removed during the excavation from different areas of the site. This brownfield site was re-developed in 2010 into a Costco, a Lowe's, and a Best Buy shopping center.

In August 2007, 1,4-dioxane was detected at 950 µg/L in the local groundwater. CrVI concentrations as high as 8,300 µg/L were initially detected in August 2010 in the groundwater beneath the former plating area of the Price Pfister site. On June 17, 2014, the RWQCB-LA approved the remedial design/remedial action workplan for full-scale treatment of hexavalent chromium in groundwater. As specified in the workplan, an emulsified vegetable oil solution in potable water was injected into the area in March 2015. The remedial action was conducted under the RWQCB-LA WDR Order No. R4-2007-0019. On August 28, 2013, the RWQCB-LA approved a 1,4-Dioxane Microcosm Study Workplan; the technical report of the study was submitted to the RWQCB-LA in March 2015. In July 2018, the RWQCB-LA approved a work plan for Area 7 assessment of soil, free hydrocarbon product, and groundwater. The ongoing remediation was reported to be effective in a December 2018 report by the site remediation consultant, AECOM. That AECOM report recommended no further active remediation, but did recommend further sampling of the groundwater for certain constituents. Additional Details are available at the RWCQCB-LA GeoTracker website: (http://geotracker.waterboards.ca.gov/).

3.7.8 General Electric, 2940 and 2960 North Hollywood Way, Burbank

The site was formerly occupied by Pacific Airmotive (PAC) and is currently owned by General Electric. Activities conducted by PAC at the site included testing; maintenance; and repair and overhaul of commercial and military aircraft engines. Those activities resulted in VOC impacts to soil and groundwater. Contaminants at the site reportedly include PCE, TCE, and 1,1,1-TCA. A soil vapor extraction system was used to remove VOCs (primarily PCE) in soil vapor from underneath 2960 No. Hollywood Way between January 2002 and February 2014. The RWQCB-LA is overseeing the soil cleanup of the site; the groundwater cleanup is overseen by USEPA. As of September 2011, PAC water quality data are included in the Lockheed-Martin semi-annual groundwater report for the BOU. Confirmation soil samples were collected in 2015 that reportedly showed the effectiveness of SVE remediation, per a Geosyntec Consultants report submitted to RWQCB-LA in December 2015.

3.7.9 Former Chase Chemical/Holchem Site, 13546 Desmond St, Pacoima

A significant VOC contaminant plume was identified in the Pacoima area near the intersection of the 118 Freeway and San Fernando Road. This area is approximately 3 miles upgradient from LADWP's Tujunga wellfield; this wellfield can supply up to 47,000

gpm of groundwater. LADWP constructed two groundwater monitoring wells downgradient of this reported contaminant plume.

The former Chase Chemical/Holchem site is located on an approximately two-acre site that was reportedly used by the Chase Chemical Company from 1967 to 1987 to store industrial chemicals in underground storage tanks, aboveground storage tanks, and other containers for packaging and resale. Holchem, Inc. leased the property in 1987, purchased it in 1999, and continued the storage and re-sale of industrial chemicals; site operation ended in 2001. Quarterly groundwater monitoring is ongoing; PCE and TCE have been two of the main VOCs detected beneath the site. Additional VOCs, such as cis-1,2-DCE, 1,1, DCE, and 1,4-dioxane also continue to be detected in the local groundwater.

3.8 EPA SHALLOW ZONE CONTAMINATION MAPS

USEPA occasionally provides the Watermaster and others with contamination "plume" maps for the Shallow aquifer zone in the eastern portion of the SFB. Appendix E shows the generalized two-dimensional approximations of contaminant contours within the Shallow Aquifer Zone in SFB, as interpreted by USEPA and/or their subcontractors, for the contaminants TCE, PCE, NO_3, and total chromium. The contour data shown in the Appendix E maps are reportedly based on sample data collected closest to April 7, 2017, between the dates of January 2012 and June 2017.

Plates

Plate 1 – Upper Los Angeles River Area: Location Map

Plate 1A – Upper Los Angeles River Area: San Fernando Groundwater Basin Map

Plate 1B – Upper Los Angeles River Area: Sylmar Groundwater Basin Map

Plate 1C – Upper Los Angeles River Area: Verdugo Groundwater Basin Map

Plate 1D – Upper Los Angeles River Area: Eagle Rock Groundwater Basin Map

Plate 2 – Upper Los Angeles River Area: Water Service Areas of Public Agencies

Plate 3 – Upper Los Angeles River Area: Components of Los Angeles River

Plate 4 – Simulated Groundwater Elevation Contour Map, Spring (April) 2018

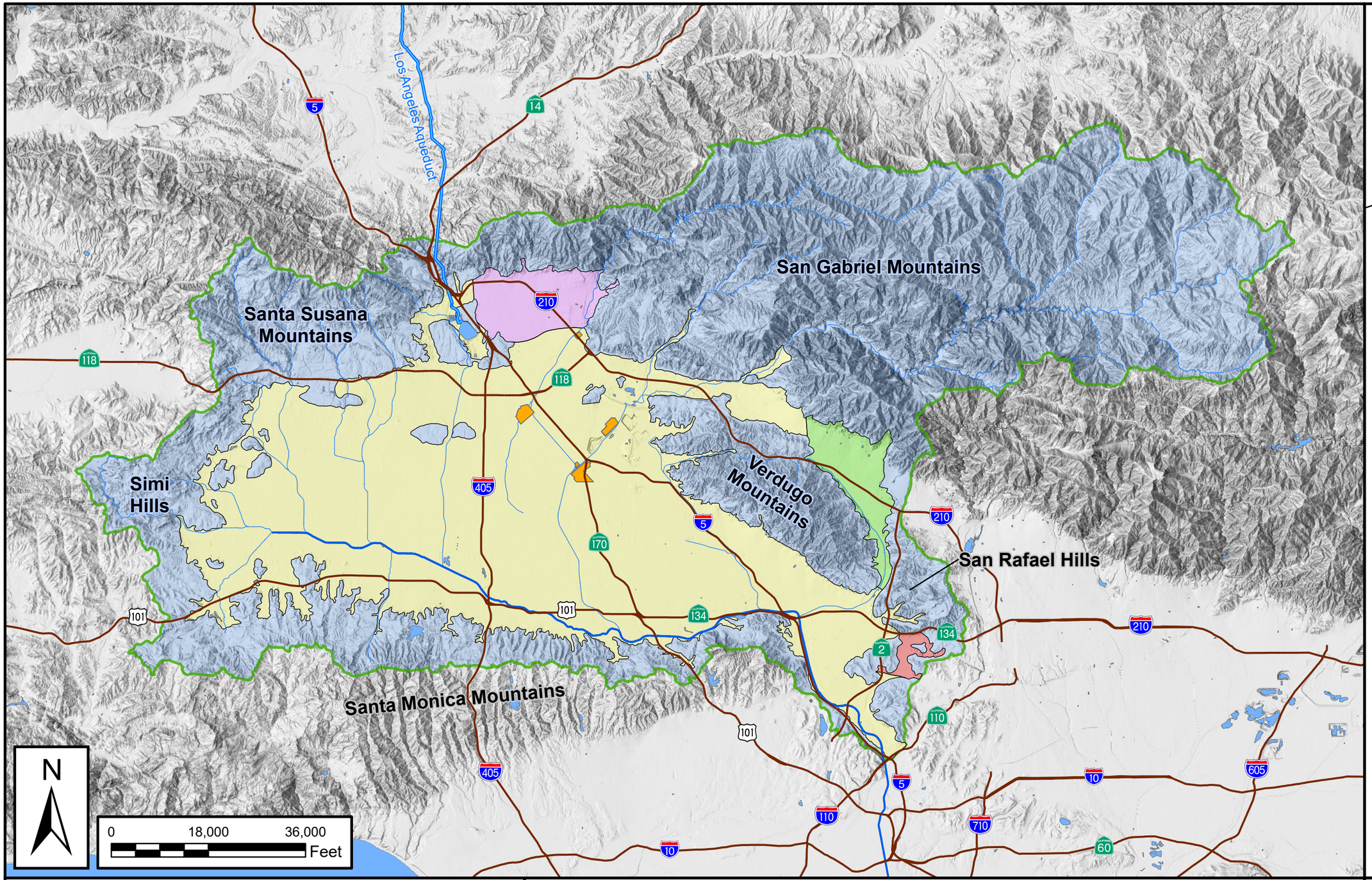
Plate 5 – Simulated Groundwater Elevation Contour Map, Fall (September) 2018

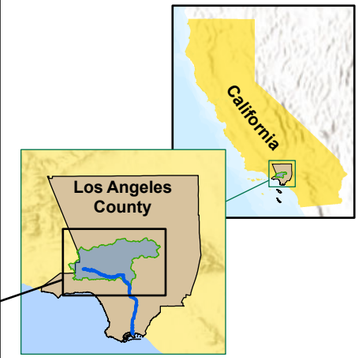
Plate 6 – Simulated Change in Groundwater Elevations, Fall 2017 - Fall 2018

Plate 7 – San Fernando Basin: Cumulative Change in Groundwater Storage

Plate 8 – Upper Los Angeles River Area: Los Angeles Bureau of Sanitation Sewer Construction Program for Commercial Parcels

Plate 9 – Upper Los Angeles River Area: Landfill Locations





LEGEND

- Los Angeles River
- Primary Stream
- Los Angeles Aqueduct
- Surface Water
- ULARA Watershed
- Spreading Ground

Groundwater Basins

- Eagle Rock
- San Fernando
- Sylmar
- Verdugo

2017-18 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area:
Location Map

Plate 1

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Santa Susana Mountains
Los Angeles Aqueduct
Sylmar Groundwater Basin
San Gabriel Mountains
Lopez
Pacoima
Hansen
Simi Hills
Branford
Tujunga
San Fernando Groundwater Basin
Verdugo Groundwater Basin
Verdugo Mountains
San Rafael Hills
Eagle Rock Groundwater Basin
Santa Monica Mountains
118
210
405
5
170
101
134
2
110
17
16
15
1
2
3
4
5
6
7
8
18
N
0 2 4 Miles

Los Angeles County

LEGEND

- San Fernando Groundwater Basin
- Los Angeles River
- Primary Stream
- Los Angeles Aqueduct
- Surface Water
- Spreading Ground
- ULARA Watershed
- City of Burbank Water Well
- City of Glendale Water Well
- LADWP Water Well
- Well with Hydrograph in Current Annual Watermaster Report

2017-18 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area:
San Fernando Groundwater Basin Map

Plate 1A

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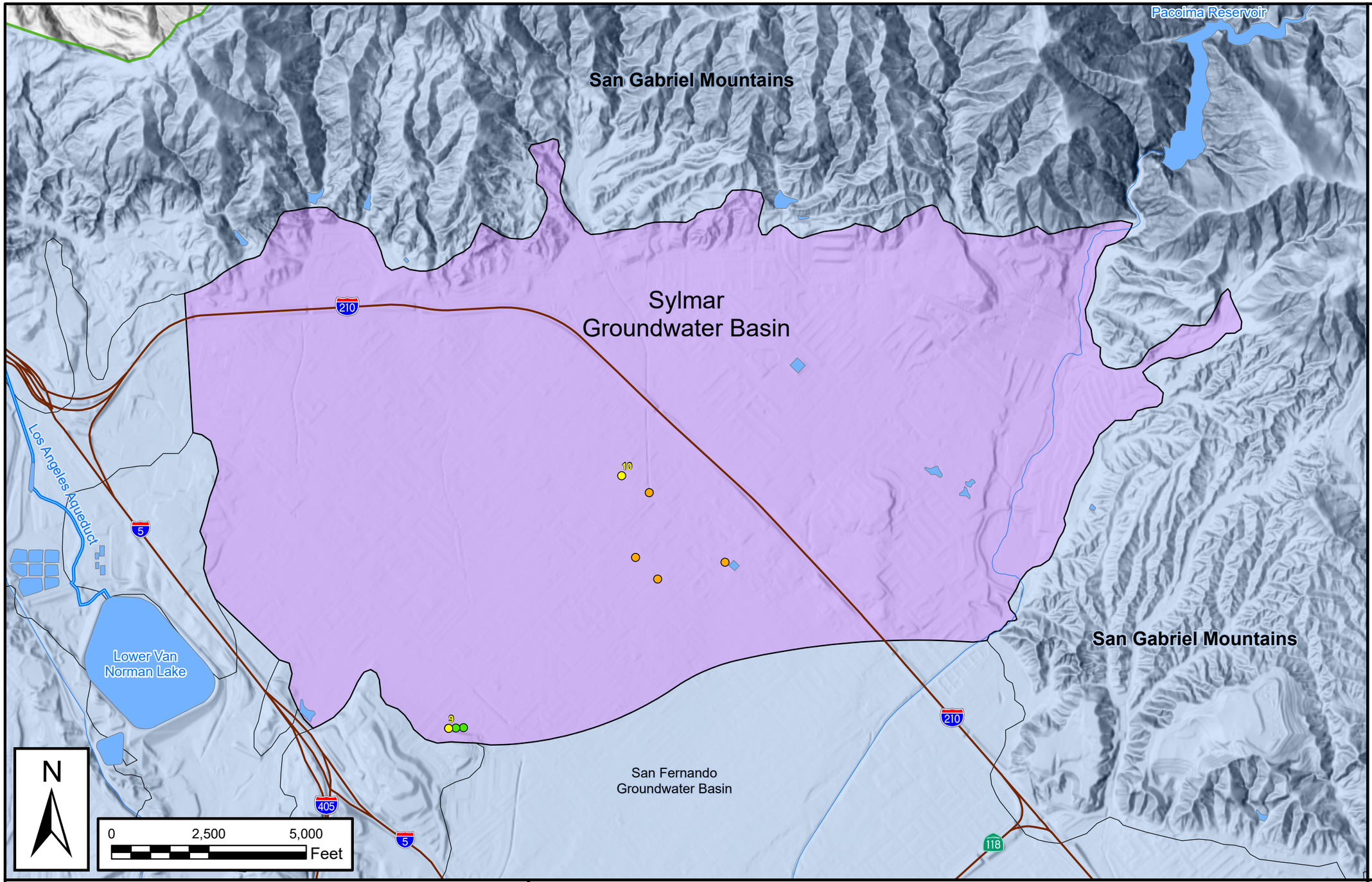

LEGEND

- Sylmar Groundwater Basin
- Los Angeles Aqueduct
- Primary Stream
- Surface Water
- ULARA Watershed
- City of San Fernando Water Well
- LADWP Water Well
- Well with Hydrograph in Current Annual Watermaster Report

2017-18 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area:
Sylmar Groundwater Basin Map

Plate 1B

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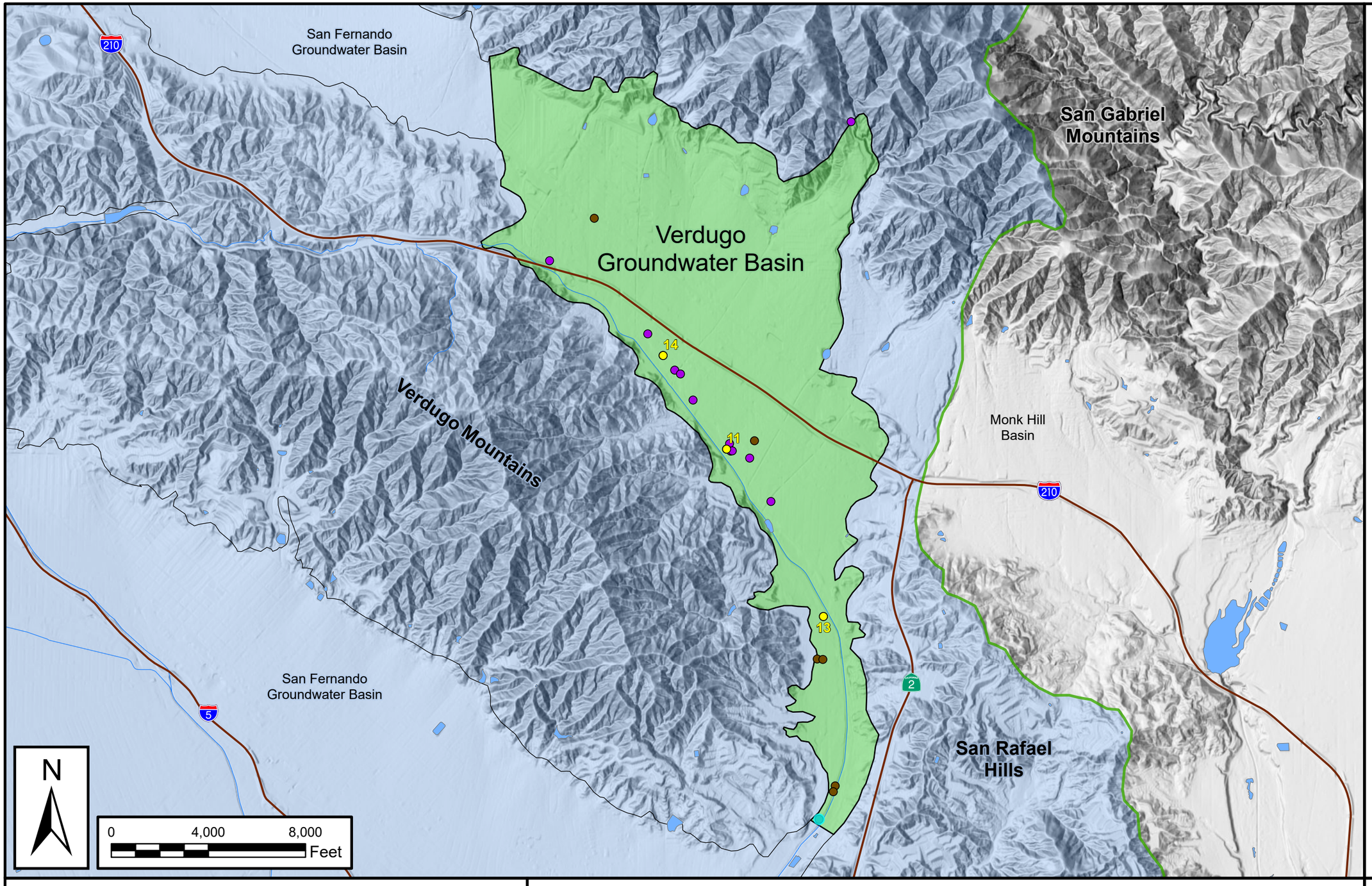

LEGEND

- Verdugo Groundwater Basin
- Primary Stream
- Surface Water
- ULARA Watershed
- City of Glendale Water Well
  Includes Verdugo Pickup System (VPCKP)
- CVWD Water Well
  Includes Pickens Tunnel
- 11 Well with Hydrograph in Current Annual Watermaster Report

2017-18 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area:
Verdugo Groundwater Basin Map

Plate 1C

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San Fernando
Groundwater Basin

San Rafael
Hills

Eagle Rock
Groundwater Basin

12

134

2

134

110

N

0 2,000 4,000
Feet

Los Angeles
County

LEGEND

- Eagle Rock Groundwater Basin
- Primary Stream
- Surface Water
- ULARA Watershed
- 12 Well with Hydrograph in Current Annual Watermaster Report

2017-18 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area:
Eagle Rock Groundwater Basin Map

Plate 1D

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Los Angeles Aqueduct

Santa Susana Mountains

San Gabriel Mountains

Simi Hills

Verdugo Mountains

San Rafael Hills

Santa Monica Mountains

LEGEND

- Los Angeles River
- Primary Stream
- Los Angeles Aqueduct
- Surface Water
- Spreading Ground
- ULARA Watershed

Water Service Areas

- City of Burbank
- City of Glendale
- City of Los Angeles
- City of Pasadena
- City of San Fernando
- Crescenta Valley Water District
- La Cañada Irrigation District
- Las Virgenes Municipal Water District

Groundwater Basins

- Eagle Rock
- San Fernando
- Sylmar
- Verdugo

N

0 12,000 24,000 Feet

2017-18 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area:
Water Service Areas of Public Agencies

Plate 2

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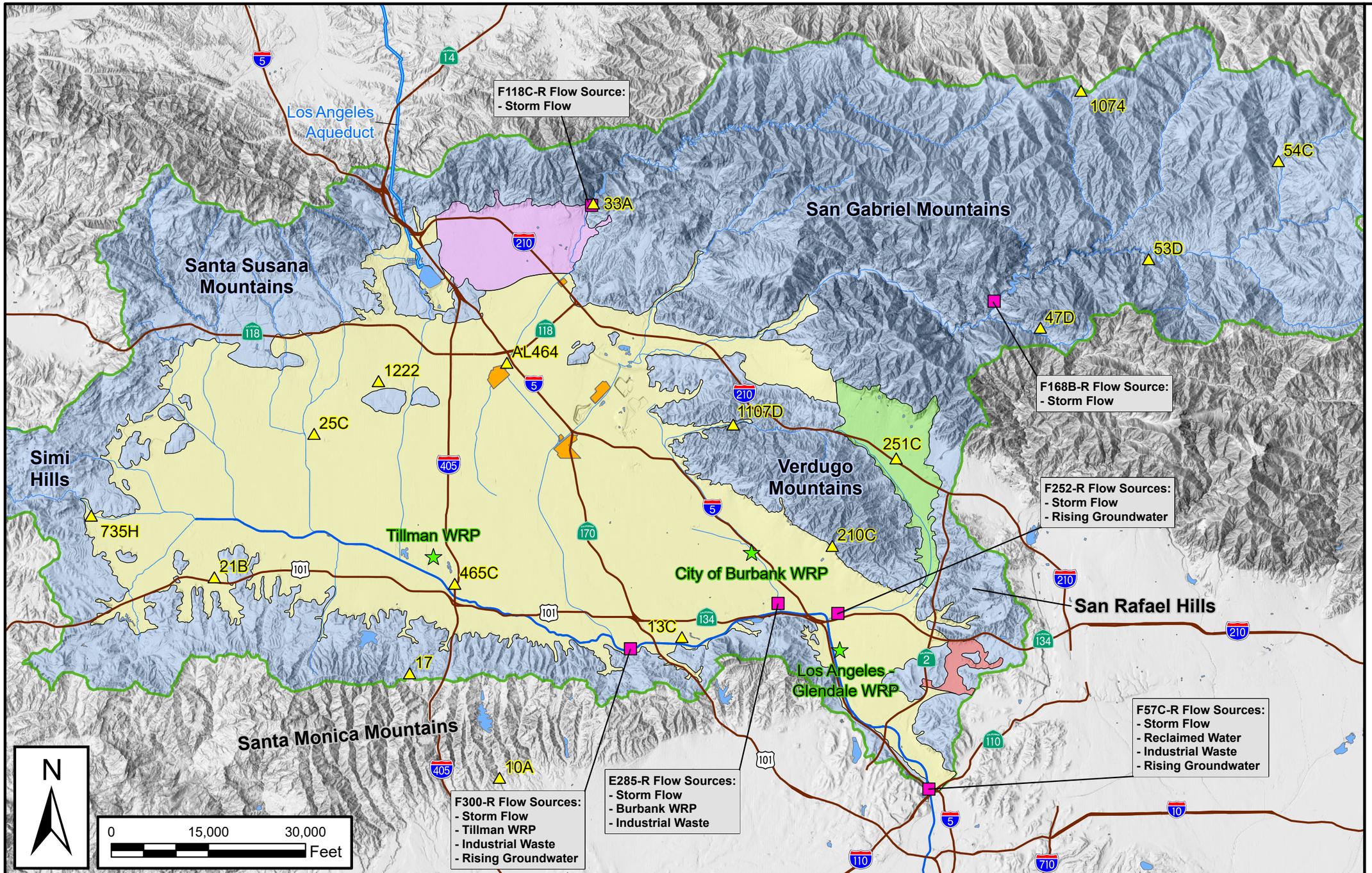

LEGEND

- Los Angeles River
- Primary Stream
- Los Angeles Aqueduct
- Surface Water
- Spreading Ground
- ULARA Watershed

- Runoff Gage
- Rainfall Gage
- Water Reclamation Plant

Groundwater Basins

- Eagle Rock
- San Fernando
- Sylmar
- Verdugo

2017-18 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area: Components of Los Angeles River Flow

Plate 3

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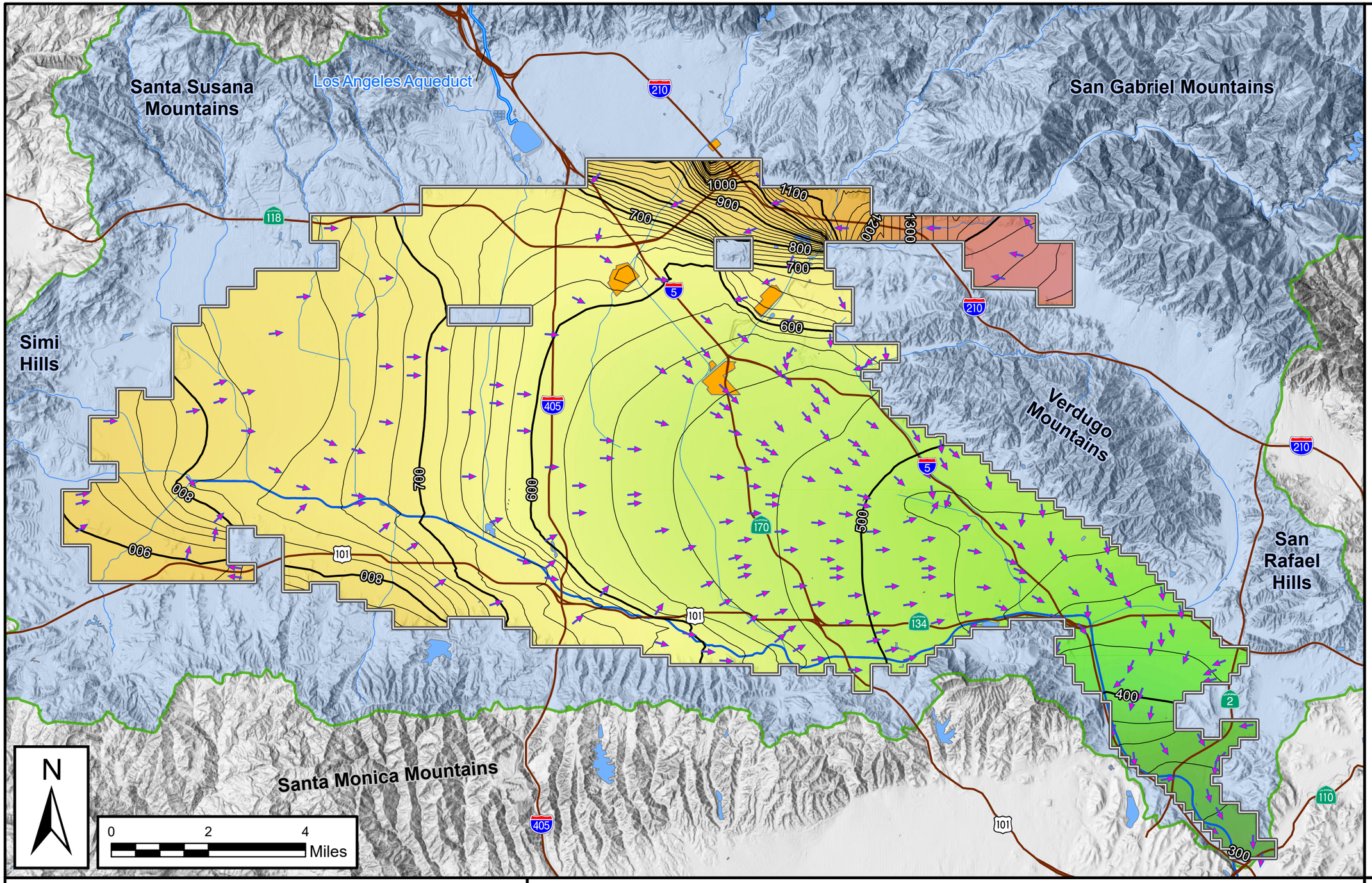

LEGEND

- Los Angeles River
- Primary Stream
- Los Angeles Aqueduct
- Surface Water
- ULARA Watershed
- Spreading Ground
- Model Active Area

Groundwater Elevations (MSL)

- 100-ft Interval Contour
- 20-ft Interval Contour
- Generalized Flow Direction

2017-18 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area: Simulated Groundwater Elevation Contour Map Spring (April) 2018

Plate 4

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Santa Susana Mountains

Los Angeles Aqueduct

San Gabriel Mountains

Simi Hills

Verdugo Mountains

San Rafael Hills

Santa Monica Mountains

1000
800
700
1100
900
1300
700
600
700
600
800
600
500
400
300

N

0 2 4 Miles

LEGEND

- Los Angeles River
- Primary Stream
- Los Angeles Aqueduct
- Surface Water
- ULARA Watershed
- Spreading Ground
- Model Active Area

Groundwater Elevations (MSL)

- 100-ft Interval Contour
- 20-ft Interval Contour
- Generalized Flow Direction

2017-18 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area: Simulated Groundwater Elevation Contour Map Fall (September) 2018

Plate 5

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Santa Susana Mountains

Los Angeles Aqueduct

San Gabriel Mountains

Simi Hills

Verdugo Mountains

San Rafael Hills

Santa Monica Mountains

LEGEND

Los Angeles River

Primary Stream

Los Angeles Aqueduct

Surface Water

ULARA Watershed

Spreading Ground

Groundwater Elevation Changes

Zero-Change Contour

+5-ft Interval Contour
(Elevation Increase)

-5-ft Interval Contour
(Elevation Decrease)

N

0 2 4 Miles

2017-18 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area: Simulated Change in Groundwater Elevations, Fall 2017 - Fall 2018

Plate 6

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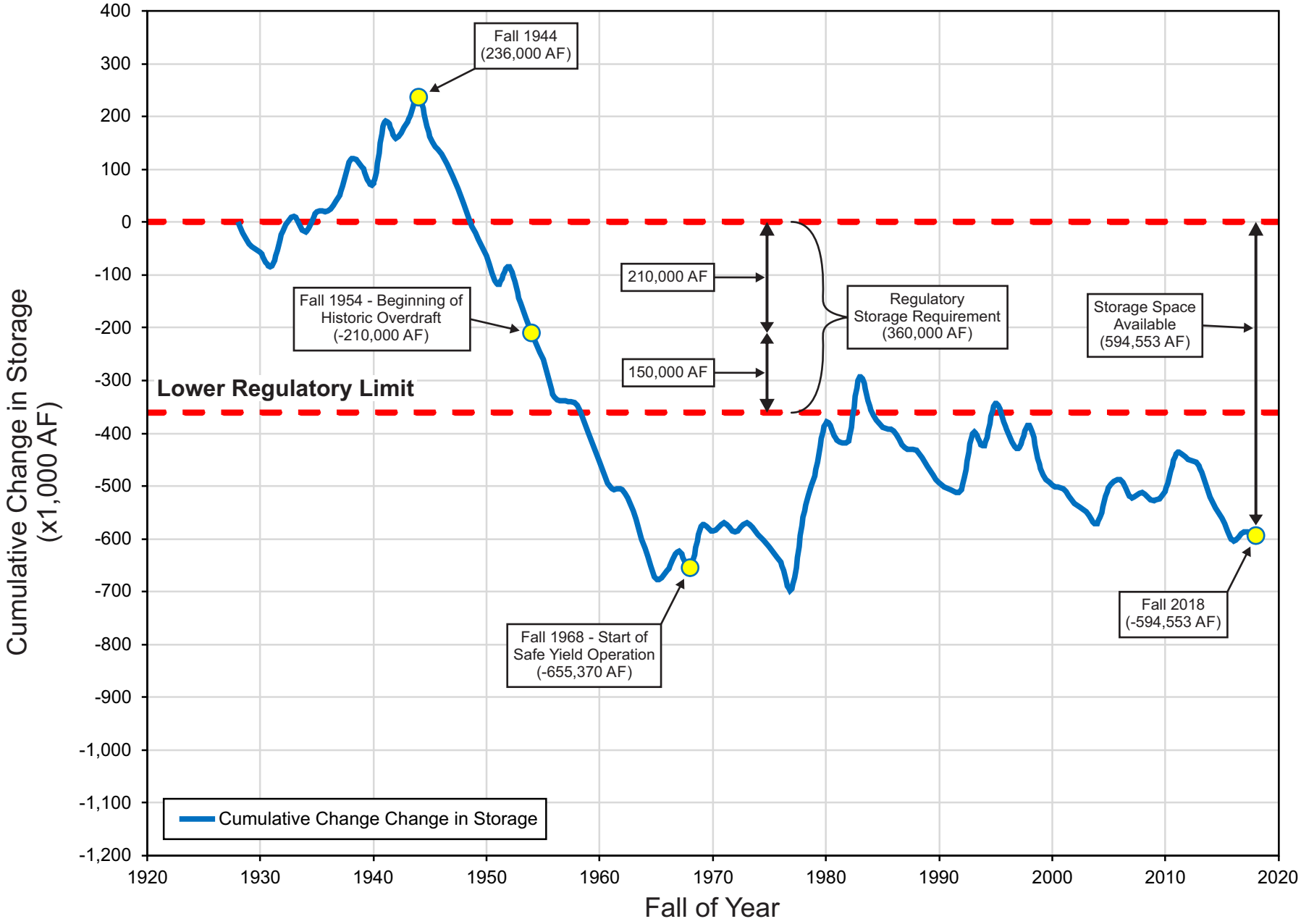

2017-18 Water Year **ULARA Watermaster Report**	**San Fernando Basin:** **Cumulative Change in Groundwater Storage**	**Plate 7**

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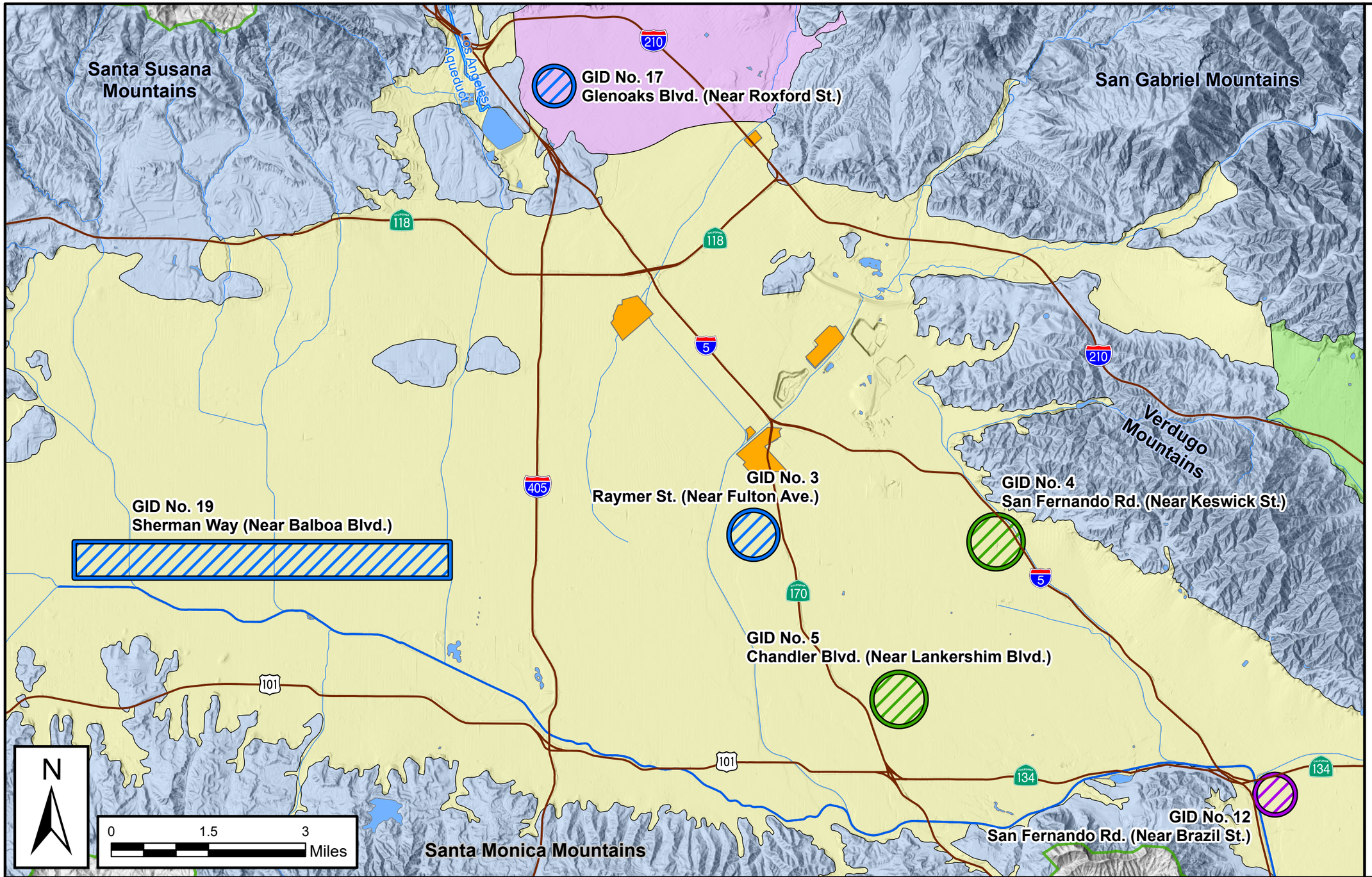

LEGEND

- Los Angeles River
- Primary Stream
- Los Angeles Aqueduct
- Surface Water
- ULARA Watershed
- Spreading Ground

Sewer Construction Status

- Ready For Construction
- Design Completed
- Under Design

Groundwater Basins

- Eagle Rock
- San Fernando
- Sylmar
- Verdugo

2017-18 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area: Los Angeles Bureau of Sanitation Sewer Construction Program for Commercial Parcels

Plate 8

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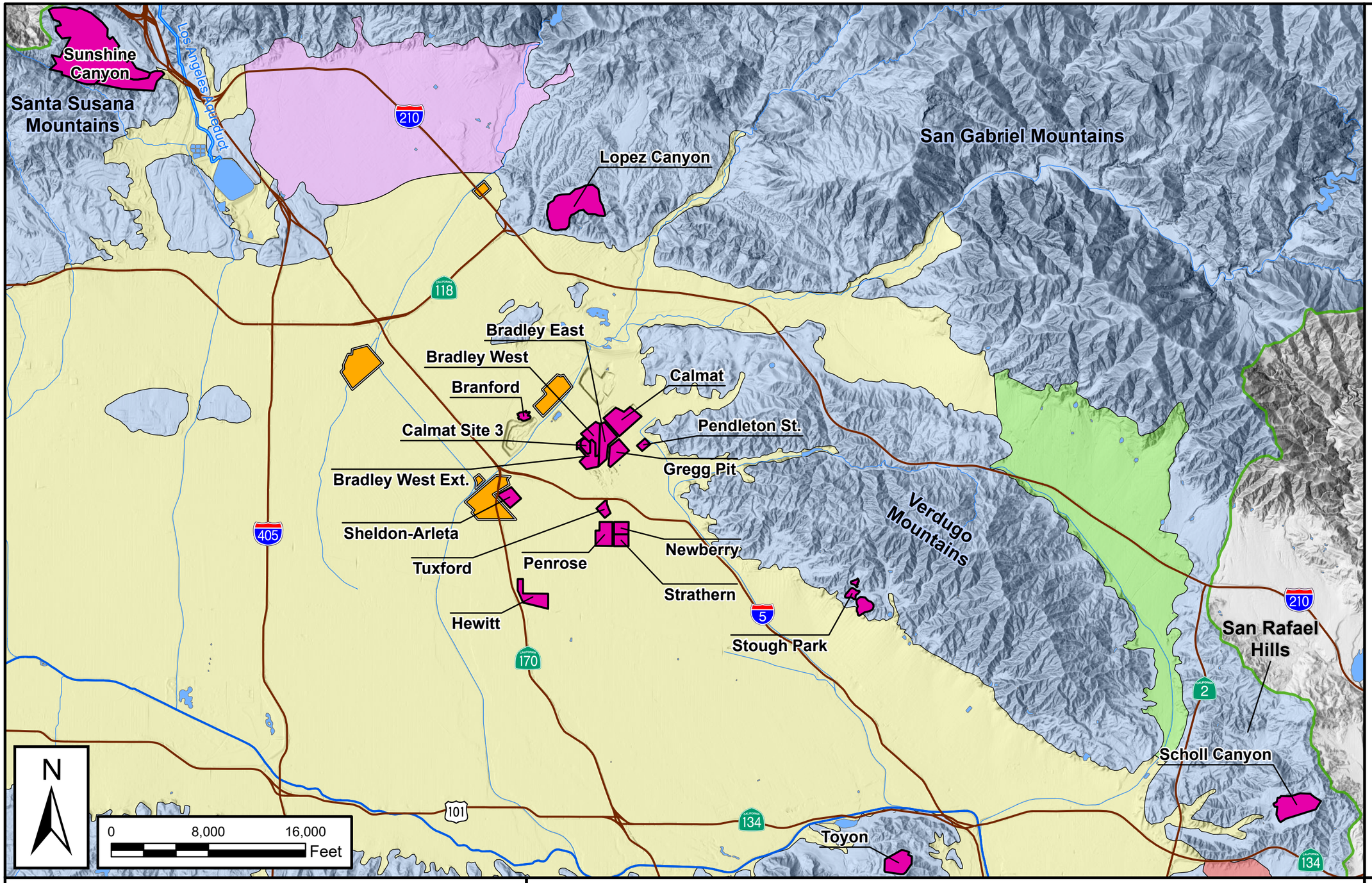

LEGEND

- Los Angeles River
- Primary Stream
- Los Angeles Aqueduct
- Surface Water
- ULARA Watershed
- Spreading Ground
- Landfill

Groundwater Basins

- Eagle Rock
- San Fernando
- Sylmar
- Verdugo

2017-18 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area:
Landfill Locations

Plate 9

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Appendix A

Groundwater Extractions

2017-18 WATER YEAR
(acre-feet)

LACDPW Well No.	Owner Well No.	2017 Oct.	Nov.	Dec.	2018 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin														
A. W. Warner Properties														
Plaza Three		0.39	0.39	0.33	0.53	0.29	0.49	0.40	0.37	0.34	0.32	0.32	0.19	4.36
Plaza Six		0.40	0.37	0.35	0.41	0.36	0.39	0.44	0.39	0.34	0.34	0.29	0.23	4.31
	Total:	0.79	0.76	0.68	0.94	0.65	0.88	0.84	0.76	0.68	0.66	0.61	0.42	8.67
Angelica Healthcare Services		(abandoned 12/97)												
3934A	M050A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avalon Encino														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bally, Nico (WLA No. 10014)														
---	---	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.72
BFI Sunshine Canyon Landfill														
---	---	7.31	6.84	6.73	7.82	6.27	8.13	7.98	12.42	8.27	10.29	9.30	7.57	98.93
Boeing (Rockwell International)														
---	E-1 to E-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Boeing Santa Susana Field Laboratory														
Delta	WS-09A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RD-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RD-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Burbank, City of														
3841C	6A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3882P	7	0.00	0.00	0.00	13.79	12.73	0.00	0.00	0.00	0.00	31.48	22.59	20.99	101.58
3851E	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3851K	13A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3882T	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	0.00	0.00	0.00	13.79	12.73	0.00	0.00	0.00	0.00	31.48	22.59	20.99	101.58
Burbank Operable Unit														
3871L	VO-1	75.48	95.29	92.25	125.80	128.79	51.53	83.40	84.23	110.16	50.56	124.68	76.71	1,098.88
3861G	VO-2	117.53	101.38	27.58	0.00	0.00	0.00	110.18	77.87	139.09	129.12	137.42	107.78	947.95
3861K	VO-3	130.18	111.47	117.55	143.41	138.68	53.13	110.43	146.54	76.95	123.42	71.12	109.84	1,332.72
3861L	VO-4	63.69	89.62	77.41	109.26	86.85	64.08	81.05	75.54	78.23	113.43	57.77	70.77	967.70
3850X	VO-5	126.46	51.12	71.27	17.70	117.53	4.80	101.00	107.39	140.26	105.04	146.02	93.75	1,082.34
3850Z	VO-6	110.96	160.33	176.15	177.07	156.91	94.67	69.97	81.24	105.11	159.08	142.98	107.96	1,542.43
3850AB	VO-7	79.51	124.01	61.09	125.99	23.23	80.39	149.66	148.26	76.59	83.17	52.27	118.14	1,122.31
3851C	VO-8	201.84	174.55	173.20	187.54	179.74	113.11	189.00	202.58	193.90	201.41	200.74	194.83	2,212.44
	Total:	905.65	907.77	796.50	886.77	831.73	461.71	894.69	923.65	920.29	965.23	933.00	879.78	10,306.77
Cecil, Debra L. and Donald R. (previously Middle Ranch; successor to estate of Cecil B. DeMille)														
4940-3	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4940-2	7	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
	Total:	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
Douglas Emmett Management, LLC (Trillium)														
Well #1	---	0.52	0.90	0.67	0.65	0.81	0.93	0.88	1.00	0.63	0.40	0.76	0.58	8.73
Well #2	---	1.44	1.53	1.30	1.35	1.40	1.53	1.35	1.52	0.98	1.22	1.30	0.98	15.90
	Total:	1.96	2.43	1.97	2.00	2.21	2.46	2.23	2.52	1.61	1.62	2.06	1.56	24.63
Fassberg Construction														
N/A		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
First Financial Plaza Site														
N/A	F.F.P.S.	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	5.66
Forest Lawn Memorial Park														
3947B	3	8.72	16.40	5.88	1.89	4.72	1.76	8.01	17.27	15.41	15.34	0.00	0.00	95.40
3947C	4	10.54	19.86	6.81	2.21	5.68	2.13	8.78	21.03	19.70	19.85	0.00	0.00	116.59
3947M	8	23.65	44.20	15.13	4.83	12.50	5.37	25.20	51.55	48.37	45.63	0.00	0.00	276.43
	Total:	42.91	80.46	27.82	8.93	22.90	9.26	41.99	89.85	83.48	80.82	0.00	0.00	488.42

2017-18 WATER YEAR
(acre-feet)

LACDPW Well No.	Owner Well No.	2017 Oct.	Nov.	Dec.	2018 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
Glendale, City of														
3924N	STPT 1	0.02	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
3924R	STPT 2	0.06	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	Total:	0.08	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
Glendale North/South														
	GN-1	63.56	72.80	80.23	30.19	41.83	78.60	86.39	82.79	74.05	81.27	71.54	47.92	811.17
	GN-2	64.23	79.92	81.24	42.57	38.56	78.57	86.33	82.56	74.78	81.15	71.43	48.32	829.66
	GN-3	72.82	60.86	77.41	71.78	24.63	58.56	79.18	82.48	78.08	76.87	76.27	78.62	837.56
	GN-4	179.09	150.67	188.22	170.10	115.48	155.84	153.33	169.79	161.53	159.64	160.82	151.70	1,916.21
	GS-1	50.74	47.22	51.06	34.89	31.79	47.60	52.33	55.15	50.74	54.86	52.11	52.76	581.25
	GS-2	53.10	66.18	74.64	68.30	44.04	67.89	64.49	75.04	65.71	53.15	66.49	69.76	768.79
	GS-3	0.00	2.02	0.72	56.49	44.12	71.51	80.71	82.51	70.20	75.35	72.35	77.87	633.85
	GS-4	45.07	39.24	41.70	11.31	17.11	2.02	0.38	0.28	1.70	11.05	0.26	0.58	170.70
	GS-5	72.23	73.61	82.17	71.43	45.61	72.89	81.21	83.09	74.54	76.00	73.68	79.43	885.89
	Total:	600.84	592.52	677.39	557.06	403.17	633.48	684.35	713.69	651.33	669.34	644.95	606.96	7,435.08
Greeff Fabrics (Inactive)														
----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grigsby, Wood (WLA No. 10011)														
----	-----	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.24
Hallelujah Prayer Center of USA (prev. Hathaway Child and Family Services; successor to estate of Cecil B. deMille)														
----	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.11	0.11	0.11	0.11	0.11	0.11	0.17	0.17	0.17	0.17	0.17	0.17	1.68
	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	0.11	0.11	0.11	0.11	0.11	0.11	0.17	0.17	0.17	0.17	0.17	0.17	1.68
Home Depot U.S.A., Inc.														
----		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Honeywell International, Inc.														
----	NHE-2	3.16	14.30	12.07	12.74	11.29	13.55	17.81	17.97	13.66	15.48	14.25	14.09	160.37
----	NHE-3	3.70	3.01	3.37	4.22	1.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.89
	*NHE-3R	----	----	----	----	----	0.39	1.01	0.14	0.00	0.33	0.00	----	1.87
	*NHE-4R	----	----	----	----	----	0.00	0.00	0.00	1.43	0.08	14.09	----	15.60
	*NHE-5R	----	----	----	----	----	0.00	0.03	1.04	0.74	0.00	0.00	----	1.81
	*New wells NHE-3R, NHE-4R, and NHE-5R are not in service. Extractions were performed during well testing.													
	Total:	6.86	17.31	15.44	16.96	12.88	13.55	17.81	17.97	13.66	15.48	14.25	14.09	195.54
Jose Diaz (010022)														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Khatcher Atamian (010006)														
----		0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.13
Lopez-Zamarripa (010007T)														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Menasco/Coltec Site														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercedes Benz of Encino (Auto Stiegler)														
---	---	0.00	0.01	0.01	0.00	0.00	0.00	0.03	0.00	0.02	0.02	0.02	0.02	0.13
Metropolitan Transportation Authority														
---	1065	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.22
---	1075	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
---	1130	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	2.30
---	1140	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
---	1150	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09
---	1070	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	25.83
---	1133	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	Total:	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38	28.57

2017-18 WATER YEAR
(acre-feet)

LACDPW Well No.	Owner Well No.	2017 Oct.	Nov.	Dec.	2018 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
Metropolitan Water District														
	Jensen	7.30	6.80	7.10	7.80	6.20	6.40	6.90	7.40	7.70	7.70	7.30	6.40	85.00
Micro Matics														
JEW	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JEW	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Middle Ranch (successor to estate of Cecil B. deMille)														
4931 x	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4940-1	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobil Oil Corporation														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(NEIS) Northeast Interceptor Sewer City of LA BOS														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raytheon (Formerly Hughes Missile Systems)														
----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RJ's Property Management (previously Middle Ranch; successor to estate of Cecil B. deMille)														
---	5	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.09	0.18	0.17	0.19	0.14	0.88
---	8	0.40	0.76	0.43	0.35	0.63	1.03	0.00	0.55	0.66	0.72	0.85	0.65	7.06
---	Spring 1&2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.01	0.00	0.00	0.07
	Total	0.50	0.77	0.43	0.35	0.63	1.03	0.00	0.68	0.85	0.91	1.05	0.79	8.00
Quaranto, John (WLA No. 010004)														
----	----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sears Roebuck & Co. (Well disconnected 10/2000)														
3945	3945	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sportsmen's Lodge														
3785A	1	0.41	0.41	0.41	0.41	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	4.42
Stallcup, Jackosn & Susan (010021)														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3M-Pharmaceuticals														
---	---	2.13	1.88	1.68	1.25	1.70	1.58	1.14	1.41	1.85	2.00	2.02	1.31	19.95
Tesoro Petroleum Corporation														
---	MW-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Toluca Lake Property Owners Association														
3845F	3845F	5.25	4.54	0.88	0.43	0.72	2.25	0.13	3.90	4.98	8.42	1.84	5.65	38.99
Valhalla Memorial Park and Mortuary														
3840K	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vulcan Materials														
4916	1	18.24	16.68	18.57	22.23	17.74	12.29	24.99	28.86	23.53	25.15	20.45	19.42	248.15
4916A	2	21.34	25.52	22.65	25.99	16.83	9.56	22.37	23.07	18.86	19.57	15.74	14.23	235.73
4916x	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sheldon Pond		81.52	37.52	36.60	61.93	85.01	87.40	93.93	109.62	90.42	75.52	63.63	56.37	879.47
	Total:	121.10	79.72	77.82	110.15	119.58	109.25	141.29	161.55	132.81	120.24	99.82	90.02	1,363.35

2017-18 WATER YEAR
(acre-feet)

LACDPW Well No.	Owner Well No.	2017 Oct.	Nov.	Dec.	2018 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
Waste Management Disposal Services of Calif. (Inactive)														
4916D		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Walt Disney Pictures and Television (Inactive)														
3874E	EAST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3874F	WEST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3874G	NORTH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Walt Disney Riverside Building (Inactive)														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waterworks District No. 21														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wildlife Waystation														
Rehab Canyon		0.07	0.07	0.07	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.66
Foreman Hill Spring		0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.54
	Total:	0.13	0.13	0.13	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	1.20
Los Angeles, City of														
Aeration (A)														
3800E	A-1					No Production - used for monitoring								0.00
3810U	A-2					A-2 and A-3 reported by Honeywell								0.00
3810V	A-3					A-2 and A-3 reported by Honeywell								0.00
3810W	A-4	5.62	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.40
3820H	A-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821J	A-6	29.45	4.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.58
3830P	A-7	14.03	1.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.00
3831K	A-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A Total:	49.10	6.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	55.98
Erwin (E)														
3831H	E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821I	E-2A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3831G	E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821F	E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3831F	E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821H	E-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.23	0.46
	E-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3811F	E-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.00	0.46
	E Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.23	0.23	0.92
Headworks (H)	Inactive Well Field													
3893Q	H-27A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3893R	H-28A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3893S	H-29A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3893T	H-30A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	H Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2017-18 WATER YEAR
(acre-feet)

LACDPW	Owner	2017			2018									
Well No.	Well No.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
					San Fernando Basin (cont'd)									
North Hollywood (NH)														
3800	NH-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3780A	NH-4	0.00	0.00	0.00	0.00	13.54	6.01	4.89	126.68	0.18	103.72	140.04	135.33	530.39
3770	NH-7	0.00	0.00	0.00	0.00	0.28	0.14	3.76	94.24	0.14	77.16	104.18	100.67	380.57
3810A	NH-13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810B	NH-14A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790B	NH-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3820D	NH-16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3820C	NH-17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3820B	NH-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3830D	NH-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3830C	NH-20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3830B	NH-21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790C	NH-22	0.00	0.00	0.00	0.62	0.62	0.92	8.10	210.10	0.62	172.02	232.28	224.47	849.75
3790D	NH-23	0.00	0.00	0.00	0.46	0.46	15.52	0.00	0.00	0.46	0.00	0.00	0.00	16.90
3790F	NH-25	0.00	0.00	0.00	0.00	4.53	1.57	0.00	0.00	0.00	0.00	0.00	0.18	6.28
3790E	NH-26	0.00	0.00	0.00	0.78	29.20	13.41	0.30	0.30	0.30	0.30	67.42	224.47	336.48
3820F	NH-27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810K	NH-28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810L	NH-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3800D	NH-30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3770C	NH-32	0.00	0.00	0.00	0.00	16.14	7.48	6.08	157.58	0.23	128.79	174.20	168.60	659.10
3780C	NH-33	0.00	0.00	0.00	0.00	0.30	0.60	7.62	205.46	0.00	168.23	226.17	219.51	827.89
3790G	NH-34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3830N	NH-35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790H	NH-36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790J	NH-37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810M	NH-38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810N	NH-39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810P	NH-40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810Q	NH-41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810R	NH-42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790K	NH-43A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790L	NH-44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790M	NH-45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	NH Total:	0.00	0.00	0.00	1.86	65.07	45.65	30.75	794.36	1.93	650.22	944.29	1,073.23	3,607.36
Pollock (P)														
3959E	P-4	181.05	173.86	175.85	187.70	155.02	182.21	172.54	181.06	171.41	92.76	0.00	0.00	1,673.46
3958H	P-6	0.12	0.07	0.10	0.11	0.26	0.12	0.12	0.13	0.12	0.10	0.00	0.00	1.25
3958J	P-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	P Total:	181.17	173.93	175.95	187.81	155.28	182.33	172.66	181.19	171.53	92.86	0.00	0.00	1,674.71

2017-18 WATER YEAR
(acre-feet)

LACDPW	Owner	2017			2018									
Well No.	Well No.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
Rinaldi-Toluca (RT)														
4909E	RT-1	0.55	0.55	0.55	1.10	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.00	6.60
4898A	RT-2	0.67	0.67	0.67	1.33	0.67	0.67	0.62	0.05	1.33	0.00	1.33	1.33	9.34
4898B	RT-3	0.00	1.03	1.03	0.51	0.51	0.51	0.51	0.51	0.51	12.97	312.83	373.03	703.95
4898C	RT-4	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	15.38	371.60	441.74	834.12
4898D	RT-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4898E	RT-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4898F	RT-7	0.87	0.87	0.87	233.82	299.72	282.35	320.20	310.86	298.83	373.65	331.34	320.20	2,773.58
4898G	RT-8	0.53	0.53	0.00	286.18	366.69	344.40	391.18	379.75	365.06	456.47	404.78	391.18	3,386.75
4898H	RT-9	2.50	0.62	1.24	0.00	0.00	1.24	0.62	0.62	1.24	1.26	0.62	0.62	10.58
4909G	RT-10	1.33	1.33	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.00	0.67	8.69
4909K	RT-11	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.00	0.60	0.60	6.60
4909H	RT-12	0.67	0.67	1.35	312.63	456.29	434.41	491.87	476.12	460.40	573.28	412.51	491.87	4,112.07
4909J	RT-13	0.60	0.60	0.60	1.19	0.60	1.19	0.00	0.60	0.60	0.60	0.60	0.00	7.18
4909L	RT-14	1.72	0.57	1.15	1.15	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	9.15
4909M	RT-15	1.10	0.55	1.10	0.55	0.00	1.65	1.10	1.10	0.55	0.55	1.10	0.00	9.35
	RT Total:	11.74	9.19	10.43	840.33	1,127.47	1,069.41	1,209.09	1,172.60	1,131.51	1,435.95	1,838.43	2,021.81	11,877.96
Tujunga (T)														
4887C	T-1	0.00	0.00	1.38	80.53	432.44	475.67	548.62	525.83	508.33	594.97	196.79	477.18	3,841.74
4887D	T-2	0.00	0.00	0.00	11.02	0.73	0.71	205.49	500.09	480.69	561.18	245.02	209.09	2,214.02
4887E	T-3	0.00	0.00	0.73	5.99	0.73	0.73	210.10	510.56	491.46	573.00	229.94	213.77	2,237.01
4887F	T-4	0.00	0.00	0.00	5.60	0.69	0.80	115.54	561.62	540.59	630.30	251.31	235.95	2,342.40
4887G	T-5	0.00	0.00	0.67	0.67	1.33	0.71	0.71	3.58	0.71	1.42	0.71	0.71	11.22
4887H	T-6	0.00	0.00	3.12	82.28	368.50	377.89	452.48	435.56	419.26	490.70	222.47	393.57	3,245.83
4887J	T-7	0.00	0.00	2.41	75.16	413.04	423.58	507.19	488.22	469.95	550.02	249.38	440.45	3,619.40
4887K	T-8	0.00	0.00	0.67	0.00	0.67	0.73	1.47	1.47	0.00	2.20	1.47	0.73	9.41
4886B	T-9	0.00	0.00	0.76	2.30	0.00	0.00	1.15	0.00	0.57	1.15	0.57	0.57	7.07
4886C	T-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4886D	T-11	0.00	0.00	0.69	0.00	0.69	0.69	0.69	0.69	0.00	0.69	1.38	0.69	6.21
4886E	T-12	0.00	0.00	0.73	4.45	0.00	1.47	107.09	499.08	496.85	580.90	179.98	0.00	1,870.55
	T Total:	0.00	0.00	11.16	268.00	1,218.82	1,282.98	2,150.53	3,526.70	3,408.41	3,986.53	1,579.02	1,972.71	19,404.86
Van Norman (VN)														
VN-1		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.60
VN-2		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VN-3		0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	1.32
VN-4		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.36
VN-5		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.24
VN-6		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.48
VN-7		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VN-8		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.36
VN-9		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VN-10		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.12
VN-11		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.72
	VN Total:	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	4.20
Verdugo (V)														
3863H	V-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3863P	V-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3863J	V-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3863L	V-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.32	0.00	0.64
3853G	V-13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	V-16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3854F	V-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3844R	V-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.32	0.00	0.64
	V Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.64	0.00	1.28

2017-18 WATER YEAR
(acre-feet)

LACDPW Well No.	Owner Well No.	2017 Oct.	Nov.	Dec.	2018 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
Whitnall (W)														
3820E	W-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821B	W-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821C	W-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821D	W-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821E	W-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3831J	W-6A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3832K	W-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3832L	W-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3832M	W-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3842E	W-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	W Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Los Angeles, City of Total:		242.36	190.35	197.89	1,298.35	2,566.99	2,580.72	3,563.38	5,675.20	4,714.37	6,166.37	4,362.96	5,068.33	36,627.27
San Fernando Basin Total:		1,948.65	1,895.75	1,816.08	2,916.16	3,991.86	3,834.19	5,366.31	7,614.55	6,545.45	8,084.12	6,105.32	6,707.44	56,845.16
Sylmar Basin														
Los Angeles, City of														
Plant	Mission													0.00
4840J	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4840K	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.10	0.00	0.00	0.43
4840S	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.10	0.00	0.00	0.43
Santiago Estates (Inactive; well capped in 1999)														
5998	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Fernando, City of														
5969D	2A	237.26	206.25	209.22	188.13	183.93	160.05	193.49	206.55	226.50	262.27	258.12	231.98	2,563.75
5959	3	0.03	0.00	0.00	0.06	0.00	0.03	0.02	0.04	0.00	0.00	0.00	0.00	0.18
5969	4	30.99	24.18	21.76	16.88	16.54	23.74	31.21	31.48	28.68	34.63	33.69	32.73	326.51
5968	7A	0.00	0.48	0.06	0.41	0.01	0.00	0.00	0.79	0.04	0.00	0.72	2.80	5.31
	Total:	268.28	230.91	231.04	205.48	200.48	183.82	224.72	238.86	255.22	296.90	292.53	267.51	2,895.75
Sylmar Basin Total:		268.28	230.91	231.04	205.48	200.48	183.82	224.72	238.86	255.55	297.00	292.53	267.51	2,896.18

2017-18 WATER YEAR
(acre-feet)

LACDPW Well No.	Owner Well No.	2017 Oct.	Nov.	Dec.	2018 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
					Verdugo Basin									
Crescenta Valley Water District														
5058B	1	7.33	4.90	6.99	6.61	3.88	4.31	6.16	6.13	7.86	6.51	6.18	5.54	72.40
5036A	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	3.27	13.06	17.01
5058H	5	41.72	38.44	38.61	36.39	31.29	33.97	32.99	32.01	30.08	30.57	26.86	24.69	397.62
5058	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5047B	7	20.32	13.88	21.55	23.62	13.48	12.30	17.31	18.55	24.96	25.15	24.77	22.90	238.79
5069J	8	15.84	13.17	15.52	20.18	16.82	17.60	17.56	16.13	15.83	16.83	17.14	5.48	188.10
5047D	9	7.12	5.01	8.11	8.78	4.95	4.52	6.52	6.98	9.42	9.03	9.73	7.80	87.97
5058D	10	5.92	5.87	6.25	6.82	1.62	0.32	5.50	6.93	6.98	8.73	8.51	7.41	70.86
5058E	11	10.69	9.80	9.16	8.99	7.46	8.79	8.32	8.20	7.78	8.38	8.07	7.31	102.95
5058J	12	7.54	7.86	8.40	7.99	7.90	9.94	8.18	7.91	6.43	7.79	7.72	7.92	95.58
5069F	14	8.45	8.35	9.87	11.21	10.68	11.49	9.37	9.42	8.98	9.33	9.12	8.40	114.67
	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PICKENS (CVWD)	3.43	3.28	3.36	3.30	2.96	3.40	3.33	3.35	3.28	3.29	3.39	3.32	39.69
	Total:	128.36	110.56	127.82	133.89	101.04	106.64	115.24	115.61	121.60	126.29	124.76	113.83	1,425.64
Knowltons														
	PICKENS	0.93	0.93	0.82	0.80	0.80	0.80	0.80	0.89	0.86	0.80	2.04	0.80	11.27
Glendale, City of														
3971	GL-3	2.23	9.94	11.76	12.51	10.99	12.10	11.66	12.15	11.22	11.40	11.29	11.31	128.56
3961	GL-4	40.34	40.13	40.17	35.47	36.63	39.33	37.96	38.65	37.15	38.00	37.55	36.13	457.51
3970	GL-6	25.05	10.25	12.55	14.04	12.08	13.81	13.09	15.02	13.59	13.10	13.17	13.88	169.63
---	VPCKP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5036	FHW	9.92	9.37	7.92	8.99	8.60	9.44	6.55	9.54	9.34	9.50	9.33	8.97	107.47
(CVWD #16)	RHW	29.07	27.94	28.44	27.86	24.34	26.67	25.02	25.05	23.31	23.10	22.44	20.79	304.03
	Total:	106.61	97.63	100.84	98.87	92.64	101.35	94.28	100.41	94.61	95.10	93.78	91.08	1,167.20
Verdugo Basin Total:		235.90	209.12	229.48	233.56	194.48	208.79	210.32	216.91	217.07	222.19	220.58	205.71	2,604.11
					Eagle Rock Basin									
Sparkletts														
3987A	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3987B	2	4.08	0.67	0.38	8.29	6.22	5.85	6.70	6.00	3.70	1.30	2.76	6.12	52.07
3987F	3	0.54	1.69	1.91	3.08	1.53	1.94	2.26	2.04	2.16	2.91	2.88	2.15	25.09
3987G	4	12.44	13.56	11.46	9.53	4.70	5.87	6.84	6.24	6.64	9.31	9.42	6.85	102.86
	Total:	17.06	15.92	13.75	20.90	12.45	13.66	15.80	14.28	12.50	13.52	15.06	15.12	180.02
Eagle Rock Basin Total:		17.06	15.92	13.75	20.90	12.45	13.66	15.80	14.28	12.50	13.52	15.06	15.12	180.02
ULARA Total:		2,469.89	2,351.70	2,290.35	3,376.10	4,399.27	4,240.46	5,817.15	8,084.60	7,030.57	8,616.83	6,633.49	7,195.78	62,525.47

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Appendix B

Key Gaging Stations of Surface Runoff and Precipitation Data

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

MARK PESTRELLA, Director

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: SWE-3

December 10, 2018

Mr. Richard C. Slade
Upper Los Angeles River Area Watermaster
12750 Ventura Boulevard, Suite 202
Studio City, CA 91604

Dear Mr. Slade:

REQUESTED HYDROLOGIC DATA FOR WATER YEAR 2017-18

The following data is enclosed as requested in your recent letter:

- Summary of water spread for the 2017-18 Water Year at Branford, Pacoima, Lopez, Hansen, and Tujunga Spreading Grounds.

- Seasonal precipitation for the 2017-18 Water Year at Stations: 10A, 13C, 1107D, 465C, 17, 21B, 735H, 25C, 33A, 47D, 53D, 54C, 210C, 251C, AL301, 1222, and 1074. Several stations have either incomplete data or have been discontinued. Data from nearby stations have been substituted.

    - The records for Stations 11D, 23B, 797, and 293B are incomplete and have been substituted with the data from Stations 10A, 735H, AL301, and 1222, respectively. These stations are owned and operated by the City of Los Angeles Department of Water and Power and they have not submitted the complete data despite our requests.

- Gaging station summaries for Stations: F57C-R, F118C-R, F300-R, F168B-R, E285-R, and F252-R.

- Available static water level data within the range of Well Nos. 3504A through 5077C for fall 2018. Incomplete or unavailable data is denoted.

As you requested, the data will be emailed to Slade@ularawatermaster.com with a cc: to the Assistant Watermaster at Hicke@ularawatermaster.com. If you have any questions regarding the data, please contact Mr. Arthur Gotingco of our Stormwater Engineering Division, Hydrologic Engineering II Unit, at (626) 458-6379 or agoting@dpw.lacounty.gov.

Very truly yours,

MARK PESTRELLA
Director of Public Works

Jaj Vasseri

For SREE KUMAR
Assistant Deputy Director
Stormwater Engineering Division

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Enc.

bc: Storm Water Engineering (Araiza)

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Summary Report

Site: 4SGTOTALWC Branford Spreading Basin Total Water Conserved.
USGS #:
Beginning Date: 10/01/2017
Ending Date: 09/30/2018

Daily Mean Discharge in Cubic feet/second Water Year Oct 2017 to Sep 2018

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	.07	.05	.05	.06	.05	.05	.06	.05	.07	.05	.07
2	.06	.06	.05	.07	.05	34.7	.05	.05	.05	.05	.06	.08
3	.06	.05	.05	.06	.05	4.19	.05	.05	.05	.05	.11	.09
4	.05	.05	.05	.06	.05	.08	.05	.05	.05	.05	.15	.07
5	.05	.25	.05	.06	.06	.07	.05	.05	.05	.05	.18	.06
6	.06	.10	.05	.05	.08	.05	.06	.05	.05	.05	.05	.06
7	.05	.05	.05	.05	.07	.05	.12	.06	.05	.07	.06	.06
8	.05	.05	.05	12.7	.07	.05	.05	.06	.06	.07	.06	.05
9	.05	.05	.05	39.7	.05	.05	.05	.05	.05	.07	.06	.05
10	.05	.05	.05	.21	.05	16.6	.05	.05	.05	.08	.06	.06
11	.05	.05	.05	.07	.05	-.83	.05	.08	.07	.06	.05	.06
12	.06	.05	.05	.05	.06	.05	.05	.08	.05	.06	.05	.06
13	.05	.05	.06	.06	.06	1.33	.05	.05	.06	.05	.05	.06
14	.05	.05	.06	.06	.05	5.64	.05	.05	.06	.06	.06	.06
15	.05	.05	.05	.05	.05	3.10	.05	.05	.07	.05	.06	.05
16	.05	.05	.05	.05	.25	.14	.05	.05	.06	.05	.06	.06
17	.05	.05	.05	.10	.06	.14	.05	.05	.05	.05	.05	.05
18	.06	.05	.05	.14	.05	.05	.05	.05	.05	.08	.07	.05
19	.06	.05	.05	.09	.05	.05	.06	.05	.05	.07	.07	.06
20	.12	.07	.13	.05	.05	.15	.05	.05	.05	.08	.05	.06
21	.05	.05	.17	.05	.05	15.6	.06	.06	.06	.09	.05	.16
22	.06	.05	.05	.05	.05	6.70	.05	.05	.06	.08	.06	.10
23	.05	.05	.05	.05	.05	-.06	.05	.05	.06	.07	.05	.05
24	.05	.05	.05	.05	.05	.05	.05	.05	.08	.06	.05	.05
25	.06	.05	.05	.05	.05	.05	.05	.05	.08	.07	.05	.05
26	.05	.05	.05	.05	2.58	.07	.08	.06	.05	.27	.05	.06
27	.05	.10	.05	.05	.26	.05	.06	.05	.05	.23	.08	.06
28	.05	.05	.05	.05	.05	.05	.05	.05	.06	.20	.06	.06
29	.08	.05	.07	.05	------	.05	.05	.05	.05	.21	.06	.06
30	.11	.05	.06	.06	------	.05	.05	.09	.05	.11	.06	.08
31	.13	------	.05	.05	------	.05	------	.05	------	.06	.08	------
Total	1.87	1.85	1.80	54.29	4.46	88.37	1.64	1.70	1.68	2.67	2.06	1.95
Mean	.060	.062	.058	1.75	.16	2.85	.055	.055	.056	.086	.066	.065
Max	.13	.25	.17	39.7	2.58	34.7	.12	.09	.08	.27	.18	.16
Min	.05	.05	.05	.05	.05	-.83	.05	.05	.05	.05	.05	.05
Acre-Ft	3.7	3.7	3.6	108	8.8	175	3.3	3.4	3.3	5.3	4.1	3.9

Wtr Year 2018	Total	164.34	Mean	.45	Max	39.7	Min	-.83	Inst Max	39.7	Acre-Ft	326
Cal Year 2017	Total	107.11	Mean	.29	Max	15.0	Min	-2.24	Inst Max	15.0	Acre-Ft	212

Summary Report

Site: 17SGTOTALWC Pacoima Spreading Grounds Total Water Conserved
USGS #:
Beginning Date: 10/01/2017
Ending Date: 09/30/2018

Daily Mean Discharge in Cubic feet/second Water Year Oct 2017 to Sep 2018

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54.1	46.9	41.8	4.58	0	0	0	0	0	42.9	0	0
2	54.9	17.3	43.6	1.27	0	179	0	0	0	48.3	0	0
3	50.9	.79	42.4	0	0	0	0	0	0	25.4	0	0
4	51.2	.79	38.2	0	0	0	0	0	0	0	0	0
5	51.0	.79	35.4	0	0	0	0	0	0	0	0	0
6	53.8	.79	35.8	0	0	0	0	0	0	0	0	0
7	54.9	18.6	35.5	0	0	0	0	0	0	0	0	0
8	54.7	41.5	35.5	12.8	0	0	0	0	0	0	0	0
9	54.3	38.8	35.5	125	0	0	0	0	0	0	0	0
10	53.8	36.5	35.5	0	0	68.2	0	0	0	0	0	0
11	53.3	36.8	35.7	0	0	4.39	0	0	0	0	0	0
12	52.6	38.3	36.0	0	0	0	0	0	0	0	0	0
13	51.8	39.0	35.7	0	0	0	0	0	0	0	0	0
14	51.9	40.3	35.2	0	0	0	0	0	0	0	0	0
15	52.2	40.9	35.9	0	0	0	0	0	0	0	0	0
16	52.8	40.1	35.8	0	0	0	0	0	0	0	0	0
17	52.7	40.0	36.1	0	0	0	0	0	0	0	0	0
18	52.4	39.7	37.4	0	0	0	0	0	0	0	0	0
19	52.0	39.7	37.3	0	0	0	0	0	0	0	0	0
20	51.5	39.9	20.7	0	0	0	0	0	0	0	0	0
21	50.3	40.6	12.6	0	0	79.1	0	0	0	0	0	0
22	50.1	42.7	21.9	0	0	165	0	0	0	0	0	0
23	50.1	43.0	23.9	0	0	15.6	0	0	0	0	0	0
24	49.5	41.5	26.7	0	0	0	0	0	0	0	0	0
25	51.0	40.6	27.3	0	0	0	0	0	.72	0	0	0
26	51.3	40.2	27.0	0	0	0	0	0	22.5	0	0	0
27	50.5	40.1	26.5	0	0	0	0	0	42.5	0	0	0
28	49.9	38.1	26.5	0	0	0	0	0	39.1	0	0	0
29	49.8	36.1	27.3	0	------	0	0	0	31.3	0	0	0
30	50.8	37.4	27.6	0	------	0	0	0	39.2	0	0	0
31	48.7	------	20.6	0	------	0	------	0	------	0	0	------
Total	1608.8	997.76	992.9	143.65	0	511.29	0	0	175.32	116.6	0	0
Mean	51.9	33.3	32.0	4.63	0	16.5	0	0	5.84	3.76	0	0
Max	54.9	46.9	43.6	125	0	179	0	0	42.5	48.3	0	0
Min	48.7	.79	12.6	0	0	0	0	0	0	0	0	0
Acre-Ft	3190	1980	1970	285	0	1010	0	0	348	231	0	0

Wtr Year 2018	Total	4546.32	Mean	12.5	Max	179	Min	0	Inst Max	179	Acre-Ft	9020
Cal Year 2017	Total	8914.48	Mean	24.4	Max	119	Min	0	Inst Max	119	Acre-Ft	17680

Summary Report

Site: 16SGTOTALWC Lopez Spreading Grounds Total Water Conserved
USGS #:
Beginning Date: 10/01/2017
Ending Date: 09/30/2018

Daily Mean Discharge in Cubic feet/second Water Year Oct 2017 to Sep 2018

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	10.0	.02	0	0	0	0	0	0	0	0
2	0	0	11.8	.02	0	0	0	0	0	0	0	0
3	0	0	13.5	.02	0	0	0	0	0	0	0	0
4	0	0	15.1	0	0	0	0	0	0	0	0	0
5	0	0	15.0	0	0	0	0	0	0	0	0	0
6	0	0	14.8	0	0	0	0	0	0	0	0	0
7	0	4.68	14.9	0	0	0	0	0	0	0	0	0
8	0	10.5	14.8	.03	0	0	0	0	0	0	0	0
9	0	10.0	14.8	.23	0	0	0	0	0	0	0	0
10	0	9.48	14.7	.02	0	0	0	0	0	0	0	0
11	0	9.31	14.7	.02	0	0	0	0	0	0	0	0
12	0	8.97	14.8	.02	0	0	0	0	0	0	0	0
13	0	8.82	14.7	.02	0	0	0	0	0	0	0	0
14	0	9.32	14.7	.02	0	0	0	0	0	0	0	0
15	0	9.65	14.8	.01	0	0	0	0	0	0	0	0
16	0	9.62	14.8	0	0	0	0	0	0	0	0	0
17	0	9.56	14.8	0	0	0	0	0	0	0	0	0
18	0	9.48	14.8	0	0	0	0	0	0	0	0	0
19	0	9.56	14.7	0	0	0	0	0	0	0	0	0
20	0	9.56	14.2	0	0	0	0	0	0	0	0	0
21	0	9.63	14.1	0	0	0	0	0	0	0	0	0
22	0	9.68	13.0	0	0	0	0	0	0	0	0	0
23	0	9.78	12.3	0	0	0	0	0	0	0	0	0
24	0	9.97	12.5	0	0	0	0	0	0	0	0	0
25	0	10.2	12.7	0	0	0	0	0	.17	0	0	0
26	0	10.2	12.9	0	0	0	0	0	.03	0	0	0
27	0	10.2	13.2	0	0	0	0	0	.02	0	0	0
28	0	9.28	13.4	0	0	0	0	0	0	0	0	0
29	0	8.37	13.6	0	------	0	0	0	0	0	0	0
30	0	8.49	14.0	0	------	0	0	0	0	0	0	0
31	0	------	8.85	0	------	0	------	0	------	0	0	------
Total	0	224.31	426.95	0.43	0	0	0	0	0.22	0	0	0
Mean	0	7.48	13.8	.014	0	0	0	0	.007	0	0	0
Max	0	10.5	15.1	.23	0	0	0	0	.17	0	0	0
Min	0	0	8.85	0	0	0	0	0	0	0	0	0
Acre-Ft	0	445	847	.85	0	0	0	0	.44	0	0	0

Wtr Year 2018	Total	651.91	Mean	1.79	Max	15.1	Min	0	Inst Max	15.1	Acre-Ft	1290
Cal Year 2017	Total	1886.64	Mean	5.17	Max	17.0	Min	0	Inst Max	17.0	Acre-Ft	3740

Summary Report

Site: 12SGTOTALWC Hansen Spreading Grounds Total Water Conserved
USGS #:
Beginning Date: 10/01/2017
Ending Date: 09/30/2018

Daily Mean Discharge in Cubic feet/second Water Year Oct 2017 to Sep 2018

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	.20	.36	.32	.99	.75	3.66	2.15	0	.42	0	0
2	.20	.20	.38	.15	.98	5.13	3.35	2.24	0	.36	0	0
3	.20	.20	.39	.45	.95	12.3	3.11	2.16	0	.37	0	0
4	.21	.21	.38	.50	.89	9.75	2.84	2.14	0	.38	0	0
5	.21	.22	.29	.54	.84	5.80	2.62	2.07	0	.32	0	0
6	.20	.22	.24	.57	.78	4.11	2.44	1.96	0	.26	0	0
7	.20	.23	.23	.59	.75	3.18	2.24	1.35	0	.18	0	0
8	.20	.23	.24	1.38	.71	2.61	2.11	.90	0	.11	0	0
9	.19	.24	.27	12.8	.73	2.25	2.02	.85	0	.09	0	0
10	.15	.27	.27	0	.72	2.62	1.85	.75	0	.12	0	0
11	.13	.28	.31	0	.74	8.95	1.79	.79	0	.18	0	0
12	.14	.29	.33	3.01	.74	5.31	1.74	.88	0	.15	0	0
13	.18	.30	.36	4.02	.79	4.18	1.67	.87	0	.11	0	0
14	.18	.29	.39	3.01	.84	8.09	1.60	.82	0	.11	0	0
15	.15	.28	.40	2.36	.79	13.9	1.54	.80	0	.11	0	0
16	.14	.29	.43	2.08	.78	0	1.50	.26	0	.10	0	0
17	.10	.29	.40	1.88	.75	0	1.50	0	0	.09	0	0
18	.08	.27	.41	1.72	.70	0	1.48	0	0	.12	0	0
19	.09	.25	.43	1.62	.68	2.24	1.47	0	0	.15	0	0
20	.14	.24	.48	1.44	.66	4.67	1.47	0	0	.14	0	0
21	.15	.22	.48	1.33	.68	9.51	1.48	0	0	.12	0	0
22	.12	.22	.49	1.28	.71	0	1.43	0	0	.12	0	0
23	.10	.21	.53	1.26	.41	0	1.41	0	0	.09	0	0
24	.04	.20	.56	1.23	.45	0	1.47	0	.46	.06	0	0
25	0	.20	.59	1.23	.63	0	1.47	0	.51	.04	0	0
26	0	.20	.60	1.22	.66	0	1.51	0	.36	.08	0	0
27	0	.20	.60	1.17	.75	2.32	1.62	0	.13	.09	0	0
28	0	.20	.60	1.15	.73	6.27	1.69	0	.11	.08	0	0
29	.04	.27	.61	1.12	------	5.46	1.75	0	.27	.10	0	0
30	.11	.36	.63	1.01	------	4.80	1.98	0	.38	.03	0	0
31	.19	------	.59	.98	------	4.14	------	0	------	0	0	------
Total	4.04	7.28	13.27	51.42	20.83	128.34	57.81	20.99	2.22	4.68	0	0
Mean	.13	.24	.43	1.66	.74	4.14	1.93	.68	.074	.15	0	0
Max	.21	.36	.63	12.8	.99	13.9	3.66	2.24	.51	.42	0	0
Min	0	.20	.23	0	.41	0	1.41	0	0	0	0	0
Acre-Ft	8.0	14	26	102	41	255	115	42	4.4	9.3	0	0

Wtr Year 2018	Total	310.88	Mean	.85	Max	13.9	Min	0	Inst Max	13.9	Acre-Ft	617
Cal Year 2017	Total	6493.62	Mean	17.8	Max	241	Min	0	Inst Max	241	Acre-Ft	12880

Summary Report

Site: 33SGTOTALWC Tujunga Spreading Grounds Total Water Conserved
USGS #:
Beginning Date: 10/01/2017
Ending Date: 09/30/2018

Daily Mean Discharge in Cubic feet/second Water Year Oct 2017 to Sep 2018

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	------	0	0	0	0	0	0	0
30	0	0	0	0	------	0	0	0	0	0	0	0
31	0	------	0	0	------	0	------	0	------	0	0	------
Total	0	0	0	0	0	0	0	0	0	0	0	0
Mean	0	0	0	0	0	0	0	0	0	0	0	0
Max	0	0	0	0	0	0	0	0	0	0	0	0
Min	0	0	0	0	0	0	0	0	0	0	0	0
Acre-Ft	0	0	0	0	0	0	0	0	0	0	0	0

Wtr Year 2018	Total	0	Mean	0	Max	0	Min	0	Inst Max	0	Acre-Ft	0
Cal Year 2017	Total	0	Mean	0	Max	0	Min	0	Inst Max	0	Acre-Ft	0

Summary Report

Site: F57C Los Angeles River Above Arroyo Seco
USGS #:
Beginning Date: 10/01/2017
Ending Date: 09/30/2018

Daily Mean Discharge in Cubic feet/second Water Year Oct 2017 to Sep 2018

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	56.5	53.5	76.3	97.2	119	128F	97.9F	75.8	66.4	61.6	51.6	51.9
2	59.4	54.4	81.0	98.8	127	2110F	94.4F	79.4	72.5	59.4	55.3	60.6
3	62.7	53.6	81.5	146	137	883F	131F	79.6	66.6	57.1	51.6	51.4
4	58.6	59.2	80.9	118	128	225F	100F	69.9	70.1	59.6	55.4	52.3
5	59.3	66.0	77.7	130	136	125F	93.5F	68.9	66.5	61.0	60.8	50.0
6	54.9	55.3	81.1	128	139	108F	88.9F	67.1	61.1	53.8	55.1	53.8
7	60.6	60.0	80.6	119	151	76.3F	88.8F	60.8	66.9	62.0	55.1	54.9
8	60.4	59.6	77.6	926	166	81.2F	88.1F	53.9	61.0	63.6	52.3	53.2
9	59.3	61.6	83.9	4120	170	66.8F	94.0F	49.5	66.5	63.5	50.9	57.5
10	54.6	59.6	79.2	298	185	154F	85.8F	48.8	67.2	60.9	49.4	54.3
11	52.9	61.3	84.5	108	182	1250F	83.6F	50.9	64.4	61.0	54.7	53.2
12	56.2	58.4	85.7	117	191	151F	73.1F	61.5	61.9	57.9	53.3	56.0
13	54.6	59.6	83.4	117	295	211F	47.7F	54.8	55.6	54.1	52.2	53.7
14	56.3	58.9	87.5	117	197	722F	67.7F	50.3	60.4	56.4	47.3	50.9
15	52.4	58.8	82.8	117	187	1520F	81.6F	58.6	61.0	56.1	49.7	51.3
16	49.7	69.1	88.1	117	173	228F	78.9F	68.2	52.1	52.3	49.4	49.5
17	45.2	86.4	93.7	117	168	250F	75.7F	69.8	65.5	48.7	47.7	50.3
18	49.6	85.6	94.2	115	177	96.7F	73.8F	69.4	63.9	54.0	55.4	48.3
19	58.7	82.9	96.2	107	116F	98.5F	76.6F	73.8	60.7	39.8	50.8	45.0
20	56.0	84.2	96.3	105	101F	92.7F	72.3	74.1	52.8	50.5	51.0	53.7
21	49.4	83.7	94.1	97.8	94.4F	2410F	67.2	78.3	62.5	55.6	55.8	65.6
22	70.7	75.8	89.4	98.5	93.7F	3500F	68.7	71.7	59.6	54.4	56.3	74.4
23	68.0	77.9	94.9	96.2	95.2F	1220F	60.2	72.7	60.4	50.7	57.5	79.5
24	58.5	72.2	95.7	105	93.0F	269F	62.9	51.3	63.6	53.8	55.4	71.9
25	61.1	75.0	90.7	136	103F	189F	64.1	45.1	59.9	62.7	59.7	73.0
26	64.7	78.4	89.4	91.1	172F	148F	62.3	57.4	62.2	53.9	55.7	69.4
27	60.7	81.8	97.8	101	413F	120F	54.7	63.0	60.3	66.9	57.0	70.3
28	60.1	80.5	97.1	106	136F	98.6F	73.2	60.8	61.5	59.5	55.0	70.2
29	62.0	79.2	93.6	112	------	109F	75.1	66.0	60.7	61.2	55.2	74.3
30	58.1	80.3	96.8	113	------	103F	72.8	70.2	72.3	63.1	53.1	75.9
31	58.1	------	99.6	118	------	94.0F	------	70.0	------	56.2	53.2	------
Total	1789.3	2072.8	2731.3	8492.6	4445.3	16837.8	2354.6	1991.6	1886.1	1771.3	1662.9	1776.3
Mean	57.7	69.1	88.1	274	159	543	78.5	64.2	62.9	57.1	53.6	59.2
Max	70.7	86.4	99.6	4120	413	3500	131	79.6	72.5	66.9	60.8	79.5
Min	45.2	53.5	76.3	91.1	93.0	66.8	47.7	45.1	52.1	39.8	47.3	45.0
Acre-Ft	3550	4110	5420	16840	8820	33400	4670	3950	3740	3510	3300	3520

Wtr Year 2018	Total	47811.9	Mean	131	Max	4120	Min	39.8	Inst Max	11400	Acre-Ft	94830
Cal Year 2017	Total	69184.2	Mean	190	Max	7840	Min	31.3	Inst Max	33600	Acre-Ft	137200

X

Summary Report

Site: F118C Pacoima Creek below Pacoima Dam
USGS #:
Beginning Date: 10/01/2017
Ending Date: 09/30/2018

Daily Mean Discharge in Cubic feet/second Water Year Oct 2017 to Sep 2018

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	0	0	0	0	0	0	0	62.7	0	0
2	0	14.5	0	0	0	16.9	0	0	0	76.8	0	0
3	0	20.7	0	0	0	12.7	0	0	0	34.5	0	0
4	0	20.9	0	0	0	0	0	0	0	0	0	0
5	0	21.2	0	0	0	0	0	0	0	0	0	0
6	0	20.4	0	0	13.8	0	0	0	0	0	0	0
7	0	20.0	0	0	19.6	0	0	0	0	0	0	0
8	0	19.6	0	5.72	19.0	0	0	0	0	0	0	0
9	0	19.2	0	19.0	18.2	0	0	0	0	0	0	0
10	0	18.7	0	0	15.4	8.01	0	0	0	0	0	0
11	0	18.3	0	0	2.39	5.24	0	0	0	0	0	0
12	0	17.5	0	0	0	0	0	0	0	0	0	0
13	0	14.7	0	0	0	3.26	0	0	0	0	0	0
14	0	7.95	0	0	0	6.71	0	0	0	0	0	0
15	0	2.10	0	0	0	6.70	0	0	0	0	0	0
16	0	.06	0	0	0	4.51	0	0	0	0	0	0
17	0	0	0	0	0	1.70	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	17.5	0	0	0	0	0
20	0	0	0	0	0	0	21.7	0	0	0	0	0
21	0	0	0	0	0	7.13	21.6	0	29.3	0	0	0
22	0	0	0	0	0	18.6	20.6	0	0	0	0	0
23	0	0	0	0	0	14.6	19.5	0	0	0	0	0
24	0	0	0	0	0	0	6.74	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	2.09	0	0	0	18.0	0	0	0
27	0	0	0	0	.70	0	0	0	21.8	0	0	0
28	0	0	0	0	0	0	0	0	29.0	0	0	0
29	0	0	0	0	------	0	0	0	71.5	0	0	0
30	0	0	0	0	------	0	0	0	65.0	0	0	0
31	0	------	0	0	------	0	------	0	------	0	0	------
Total	0	235.81	0	24.72	91.18	106.06	107.64	0	234.6	174.0	0	0
Mean	0	7.86	0	.80	3.26	3.42	3.59	0	7.82	5.61	0	0
Max	0	21.2	0	19.0	19.6	18.6	21.7	0	71.5	76.8	0	0
Min	0	0	0	0	0	0	0	0	0	0	0	0
Acre-Ft	0	468	0	49	181	210	214	0	465	345	0	0

Wtr Year 2018	Total	974.01	Mean	2.67	Max	76.8	Min	0	Inst Max	312	Acre-Ft	1930
Cal Year 2017	Total	4259.13	Mean	11.7	Max	166	Min	0	Inst Max	842	Acre-Ft	8450

Summary Report

Site: F300 Los Angeles River at Tujunga Avenue
USGS #:
Beginning Date: 10/01/2017
Ending Date: 09/30/2018

Daily Mean Discharge in Cubic feet/second Water Year Oct 2017 to Sep 2018

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68.0	76.6	68.7	74.3	76.3	78.6	68.9	69.2	58.8	52.4	54.2	63.3
2	69.6	81.1	71.4	80.8	76.0	1870	68.7	72.3	60.5	50.9	57.4	63.8
3	70.8	79.8	71.7	100	77.2	785	70.5	68.6	59.2	51.5	56.1	62.3
4	65.5	76.3	71.4	85.9	73.1	107	70.6	62.4	59.7	55.5	59.7	60.8
5	64.8	85.6	68.2	79.2	76.4	80.1	70.4	64.1	54.3	51.6	64.2	59.5
6	61.0	75.1	71.0	81.2	76.1	69.9	67.0	66.2	54.4	49.0	63.0	60.7
7	75.3	74.4	68.6	75.7	77.1	49.2	71.0	48.0	54.3	51.5	67.8	59.0
8	67.9	76.2	71.1	820	77.1	41.7	68.8	50.8	53.9	54.3	63.1	59.2
9	64.9	76.8	72.5	3750	74.6	41.7	66.0	45.5	54.5	52.3	59.2	63.7
10	60.6	76.4	66.1	453	76.4	758	64.1	45.5	55.4	50.2	58.6	63.1
11	64.7	76.8	74.2	117	74.7	768	67.5	44.8	50.2	47.6	54.4	59.4
12	65.5	72.8	74.0	93.9	73.7	77.4	52.9	55.4	47.0	46.3	58.1	61.4
13	61.7	73.0	73.0	82.7	86.0	166	32.8	48.2	46.7	51.3	56.4	59.9
14	61.4	72.6	75.3	78.8	71.4	519	49.0	52.0	49.8	48.5	52.5	59.0
15	58.2	73.2	76.6	80.9	71.1	1230	57.3	57.7	45.0	49.1	56.0	56.0
16	55.3	76.1	81.6	80.5	65.3	105	56.7	62.8	39.9	47.3	53.9	55.9
17	53.2	76.0	80.0	81.5	66.7	122	59.9	63.9	50.6	47.4	56.2	58.4
18	60.1	72.8	78.0	78.6	66.4	65.7	59.2	67.8	51.0	46.4	54.6	57.3
19	60.7	70.5	81.0	80.3	64.3	65.1	63.4	69.3	45.4	33.3	54.0	56.3
20	61.9	76.2	86.2	79.6	67.5	62.9	51.3	71.4	47.2	45.8	57.0	57.3
21	75.9	71.6	79.6	74.4	68.4	1880	50.0	71.2	49.5	51.3	66.2	57.8
22	77.5	67.4	78.1	74.8	65.8	2190	51.5	63.0	48.7	48.9	65.5	59.2
23	80.6	68.1	79.0	76.4	61.6	1050	45.4	63.5	51.7	47.7	63.3	60.8
24	69.6	66.3	80.2	111	62.9	140	54.0	36.9	53.9	48.5	64.9	60.4
25	67.9	68.8	75.3	80.7	66.8	107	52.0	43.9	52.6	51.4	64.8	61.2
26	68.8	69.1	76.0	60.4	105	87.8	32.4	58.8	51.5	56.1	62.7	55.8
27	71.6	71.5	79.4	72.7	368	81.0	56.9	62.8	51.2	68.3	67.5	55.5
28	68.2	68.1	74.2	74.2	79.7	71.0	63.2	65.0	53.1	58.7	60.2	57.3
29	72.1	70.3	76.5	76.9	------	75.7	67.7	65.7	58.8	60.0	63.4	57.9
30	69.2	69.0	75.3	76.0	------	71.6	68.2	70.0	60.7	59.2	58.3	58.4
31	72.1	------	77.6	77.1	------	68.8	------	55.9	------	57.3	65.9	------
Total	2064.6	2208.5	2331.8	7308.5	2345.6	12885.2	1777.3	1842.6	1569.5	1589.6	1859.1	1780.6
Mean	66.6	73.6	75.2	236	83.8	416	59.2	59.4	52.3	51.3	60.0	59.4
Max	80.6	85.6	86.2	3750	368	2190	71.0	72.3	60.7	68.3	67.8	63.8
Min	53.2	66.3	66.1	60.4	61.6	41.7	32.4	36.9	39.9	33.3	52.5	55.5
Acre-Ft	4100	4380	4630	14500	4650	25560	3530	3650	3110	3150	3690	3530

Wtr Year 2018	Total	39562.9	Mean	108	Max	3750	Min	32.4	Inst Max	10300	Acre-Ft	78470
Cal Year 2017	Total	49769.5	Mean	136	Max	6440	Min	39.9	Inst Max	24000	Acre-Ft	98720

Los Angeles County Dept of Public Works

USDAY V106 Output 10/11/2018

Summary Report

Site: F168B Big Tujunga Creek below Big Tujunga Dam
USGS #:
Beginning Date: 10/01/2017
Ending Date: 09/30/2018

Daily Mean Discharge in Cubic feet/second Water Year Oct 2017 to Sep 2018

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.34	0	0	0	0	0	0	2.19	5.34	3.36	3.14	3.41
2	4.47	0	0	0	0	1.32	0	.73	5.10	3.32	3.14	3.48
3	4.60	0	0	0	0	1.24	0	.16	4.90	3.38	3.14	3.48
4	4.46	0	0	0	0	.66	0	0	4.86	3.35	3.05	3.47
5	5.94	0	0	0	0	.18	0	0	5.16	3.21	3.04	3.11
6	4.29	0	0	0	0	.02	0	0	5.25	3.03	2.99	2.85
7	4.18	0	0	0	0	0	0	2.45	5.31	3.04	2.99	2.85
8	4.17	0	0	1.58	0	0	0	5.82	5.18	2.98	2.98	2.89
9	4.21	0	0	5.93	0	0	0	6.00	5.10	2.90	2.93	2.96
10	3.99	0	0	3.09	0	.26	0	6.19	5.22	2.83	3.03	3.05
11	3.96	0	0	2.29	0	.29	0	6.50	5.36	2.76	3.05	3.15
12	3.95	0	0	.45	0	0	0	6.50	4.81	2.85	3.12	3.22
13	3.92	0	0	0	0	.05	0	6.55	4.28	2.87	3.14	3.14
14	3.86	0	0	0	0	.47	0	6.53	3.96	2.91	3.33	3.07
15	3.71	0	0	0	0	1.36	0	6.62	4.10	2.90	3.18	3.05
16	3.65	0	0	0	0	.76	0	6.83	4.51	3.00	2.83	3.05
17	3.67	0	0	0	0	.67	0	7.35	4.49	3.17	2.49	3.09
18	3.58	0	0	0	0	.40	0	7.64	4.47	3.22	2.64	3.17
19	3.58	0	0	0	0	.29	0	8.07	4.49	3.22	2.88	3.16
20	3.57	0	0	0	0	.34	0	7.84	4.62	3.21	3.21	3.22
21	3.58	0	0	0	0	.71	0	7.37	4.60	3.24	3.27	3.13
22	3.57	0	0	0	0	2.13	0	6.93	4.76	3.19	3.27	3.06
23	3.53	0	0	0	0	.98	0	5.73	4.67	3.18	3.25	3.09
24	3.36	0	0	0	0	.55	0	5.79	4.52	3.17	3.21	3.15
25	2.25	0	0	0	0	.40	0	5.72	4.11	3.17	3.21	3.17
26	.59	0	0	0	.08	.27	0	5.59	3.92	3.15	3.15	3.11
27	.15	0	0	0	.14	.12	0	5.39	3.89	3.16	3.13	3.14
28	0	0	0	.05	0	.10	0	5.16	3.76	3.11	3.11	3.27
29	0	0	0	0	------	.10	0	5.12	3.60	3.10	3.20	3.46
30	0	0	0	0	------	.03	0	5.30	3.40	3.17	3.33	3.50
31	0	------	0	0	------	0	------	5.37	------	3.13	3.38	------
Total	99.13	0	0	13.39	0.22	13.70	0	157.44	137.74	96.28	95.81	94.95
Mean	3.20	0	0	.43	.008	.44	0	5.08	4.59	3.11	3.09	3.17
Max	5.94	0	0	5.93	.14	2.13	0	8.07	5.36	3.38	3.38	3.50
Min	0	0	0	0	0	0	0	0	3.40	2.76	2.49	2.85
Acre-Ft	197	0	0	27	.44	27	0	312	273	191	190	188

Wtr Year 2018	Total	708.66	Mean	1.94	Max	8.07	Min	0	Inst Max	26.3	Acre-Ft	1410
Cal Year 2017	Total	6452.43	Mean	17.7	Max	217	Min	0	Inst Max	719	Acre-Ft	12800

Summary Report

Site: E285 Burbank-Western Storm Drain
USGS #:
Beginning Date: 10/01/2017
Ending Date: 09/30/2018

Daily Mean Discharge in Cubic feet/second Water Year Oct 2017 to Sep 2018

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.42	6.22	8.70	11.8	8.42	12.6F	8.23F	5.09	3.67	1.20	1.58	.84
2	5.29	6.04	7.99	10.7	9.05	33.7F	7.90F	4.30	3.16	2.09	1.42	2.50
3	5.77	6.39	9.20	11.7	9.05	33.7F	7.88F	3.98	1.95	1.58	.79	3.16
4	5.74	6.48	8.97	11.3	8.07	14.2F	6.05F	3.29	1.58	.84	.79	3.28
5	3.65	6.78	10.4	11.3	7.90	10.4F	5.69F	3.21	1.58	.90	.80	3.16
6	3.00	6.75	11.8	11.7	7.50	10.4F	5.99F	4.43	1.24	.79	1.58	3.22
7	3.46	6.40	9.44	11.5	7.11	12.0F	4.73F	6.21	.79	.79	2.14	3.16
8	3.71	6.12	9.54	62.2	8.10	15.3F	5.11F	4.80	.79	.97	2.37	3.00
9	4.70	6.38	13.5	294	8.40	11.5F	8.43F	4.78	1.17	1.54	2.37	2.80
10	5.61	6.40	13.5	8.97	9.35	19.4F	9.02	5.27	1.58	1.13	2.37	3.01
11	5.00	6.57	12.1	6.74	9.12	28.2F	3.42	5.08	1.58	.79	1.82	2.91
12	4.91	6.24	12.2	6.45	11.0	13.6F	4.68	6.14	1.29	.79	1.36	3.16
13	5.20	6.37	12.7	4.32	15.6	15.0F	4.84	5.85	.79	.79	1.58	3.16
14	5.96	6.29	9.74	4.61	10.5	21.7F	4.67	5.87	1.38	5.83	1.58	3.16
15	3.99	6.27	5.11	5.56	11.0	177F	5.59	5.46	1.45	5.61	1.71	3.82
16	4.44	5.87	9.77	5.20	12.3	18.6F	4.09	4.85	2.04	4.91	2.37	3.83
17	4.70	6.52	13.0	4.78	13.3	12.9F	4.04	4.74	3.45	4.74	2.63	3.98
18	5.13	6.60	13.1	4.92	12.7	10.5F	4.19	4.64	2.92	4.20	3.00	3.86
19	5.14	7.00	11.4	5.36	10.7	10.2F	3.59	4.39	1.43	3.77	3.68	3.57
20	5.97	7.31	12.5	5.57	11.3	12.9F	2.67	4.09	.96	3.16	3.95	3.22
21	6.25	6.75	13.1	6.47	11.4	29.7F	3.53	5.97	.79	2.59	3.95	3.16
22	5.00	6.88	13.6	6.23	11.0	44.7F	4.02	6.38	.79	2.10	3.95	3.13
23	4.67	6.92	14.3	6.10	11.6	27.7F	4.97	7.46	.79	1.58	3.95	2.78
24	3.41	6.84	15.3	7.98	12.3	12.0F	4.56	8.75	.79	1.58	3.95	2.90
25	4.22	6.52	14.9	8.07	13.3	10.2F	3.94	6.58	.79	1.58	3.95	2.37
26	4.35	6.71	12.8	9.05	18.8	10.1F	4.67	4.92	.79	1.58	3.35	2.87
27	4.75	9.69	15.1	8.49	23.9	9.20F	3.65	4.03	.79	1.13	2.78	3.16
28	5.46	9.40	15.7	8.73	13.9	8.90F	4.96	3.95	1.43	2.22	2.37	3.16
29	5.24	9.03	15.1	8.05	------	8.18F	4.74	3.95	1.58	3.39	2.88	3.37
30	6.39	9.82	13.5	8.05	------	8.90F	4.86	5.38	.99	4.12	3.16	3.46
31	6.65	------	12.5	8.36	------	9.05F	------	5.60	------	5.72	2.32	------
Total	152.18	207.56	370.56	584.26	316.67	672.43	154.71	159.44	44.33	74.01	76.50	93.16
Mean	4.91	6.92	12.0	18.8	11.3	21.7	5.16	5.14	1.48	2.39	2.47	3.11
Max	6.65	9.82	15.7	294	23.9	177	9.02	8.75	3.67	5.83	3.95	3.98
Min	3.00	5.87	5.11	4.32	7.11	8.18	2.67	3.21	.79	.79	.79	.84
Acre-Ft	302	412	735	1160	628	1330	307	316	88	147	152	185

Wtr Year 2018	Total	2905.81	Mean	7.96	Max	294	Min	.79	Inst Max	3560	Acre-Ft	5760
Cal Year 2017	Total	3594.77	Mean	9.85	Max	582	Min	0	Inst Max	5150	Acre-Ft	7130

Los Angeles County Dept of Public Works

USDAY V106 Output 10/15/2018

Summary Report

Site: F252 Verdugo Wash At Estelle Avenue
USGS #:
Beginning Date: 10/01/2017
Ending Date: 09/30/2018

Daily Mean Discharge in Cubic feet/second Water Year Oct 2017 to Sep 2018

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.71	.45	.32	.30	1.46	1.21	.63	1.26	1.44	.20	.32	1.01
2	.57	.32	.32	.32	1.80	45.6	.63	1.46	1.01	.32	.32	1.23
3	.67	.32	.32	.32	1.98	37.4	.63	1.46	1.01	.32	.32	1.26
4	.63	.32	.32	.32	1.76	5.68	.34	1.46	1.01	.32	.32	1.32
5	.57	.32	.11	.32	1.46	1.13	.48	1.11	1.01	.32	.12	1.43
6	.32	.32	.10	.32	1.46	.94	.63	1.01	1.01	.32	.10	1.19
7	.32	.32	.10	.32	1.06	.74	1.12	1.01	.79	.32	.10	1.01
8	.22	.32	.10	8.67	1.01	1.01	1.46	1.01	.63	.32	.10	1.22
9	.23	.32	.10	339	1.01	.69	1.46	1.01	.63	.32	.10	1.22
10	.22	.32	.10	12.1	1.01	6.77	1.46	.88	.63	.32	.10	1.23
11	.22	.32	.10	1.85	1.01	34.9	1.46	1.88	.63	.32	.10	1.25
12	.11	.32	.10	1.46	1.01	6.20	1.46	6.02	.33	.32	.10	1.15
13	.20	.32	.10	1.46	1.01	4.90	1.43	2.39	.32	.32	.10	1.16
14	.32	.32	.10	1.46	1.01	27.3	1.16	1.98	.32	.32	.47	1.15
15	.29	.32	.10	1.46	1.01	183	1.34	1.86	.32	.11	.92	1.01
16	.18	.32	.10	1.43	1.01	8.94	1.01	1.46	.32	.10	.97	1.01
17	.10	.32	.10	1.01	1.01	12.8	1.01	1.46	.32	.10	1.14	1.01
18	.20	.32	.10	1.01	.94	1.92	1.01	1.46	.32	.26	1.03	1.01
19	.29	.32	.10	1.26	.63	1.65	1.18	1.46	.32	.32	.89	1.26
20	.30	.32	.10	1.74	.63	1.46	1.46	1.46	.32	.32	.98	1.01
21	.31	.32	.10	1.13	.63	22.1	1.46	1.71	.32	.32	1.26	1.01
22	.21	.32	.10	.65	.39	71.9	1.46	1.98	.32	.32	1.01	1.04
23	.21	.32	.10	.63	.32	36.1	1.46	1.55	.32	.32	.88	1.11
24	.32	.32	.10	.63	.32	3.25	1.45	1.46	.29	.32	1.05	1.20
25	.30	.32	.10	.45	.32	1.92	1.01	1.46	.10	.32	.80	1.11
26	.28	.32	.10	.32	.35	1.46	1.01	1.46	.10	.32	.82	1.20
27	.32	.32	.10	.32	4.04	1.46	1.01	1.46	.10	.32	.76	1.01
28	.27	.32	.10	.32	2.15	1.46	1.01	1.16	.10	.32	.80	1.01
29	.22	.32	.10	.32	------	1.43	1.01	1.01	.10	.32	.84	1.01
30	.32	.32	.12	.86	------	1.01	1.01	1.24	.10	.32	.92	1.01
31	.47	------	.32	1.31	------	.70	------	1.46	------	.32	1.01	------
Total	9.90	9.73	4.23	383.07	31.80	527.03	33.25	49.05	14.54	9.09	18.75	33.85
Mean	.32	.32	.14	12.4	1.14	17.0	1.11	1.58	.48	.29	.60	1.13
Max	.71	.45	.32	339	4.04	183	1.46	6.02	1.44	.32	1.26	1.43
Min	.10	.32	.10	.30	.32	.69	.34	.88	.10	.10	.10	1.01
Acre-Ft	20	19	8.4	760	63	1050	66	97	29	18	37	67

Wtr Year 2018	Total	1124.29	Mean	3.08	Max	339	Min	.10	Inst Max	1920	Acre-Ft	2230
Cal Year 2017	Total	1681.37	Mean	4.61	Max	305	Min	.10	Inst Max	1720	Acre-Ft	3330

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 10A Bel Air Hotel Year 2017/18
Variable 11.03 Rainfall in Inches, ALERT Transmitted Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1						0.03		0.15					1
2						2.04							2
3						0.16							3
4													4
5		0.01											5
6													6
7													7
8				0.46									8
9				1.56									9
10						0.82							10
11				0.01		0.07							11
12					0.01			0.18					12
13						0.08							13
14						0.25							14
15						0.48							15
16						0.05							16
17		0.01				0.01							17
18										0.06			18
19							0.03						19
20													20
21						0.73							21
22						1.04							22
23						0.09							23
24													24
25													25
26					0.11								26
27													27
28													28
29													29
30								0.02					30
31													31
Mean	0.00	0.00	0.00	0.07	0.00	0.19	0.00	0.01	0.00	0.00	0.00	0.00	
Maximum	0.00	0.01	0.00	1.56	0.11	2.04	0.03	0.18	0.00	0.06	0.00	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.00	0.02	0.00	2.03	0.12	5.85	0.03	0.35	0.00	0.06	0.00	0.00	

Summaries

Annual Mean	0.02
Annual Total	8.46

	Maximum	Minimum
Daily	2.04	0.00

---------- Notes ----------
All recorded data is continuous and reliable

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 13C North Hollywood - Lakeside Year 2017/18
Variable 11.01 Rainfall in Inches, Daily manual reading Table Type Rain
Figures are for a 24-hour period

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2						0.16$							2
3						0.62$							3
4						0.06$							4
5													5
6													6
7													7
8													8
9				1.20$									9
10				1.21$									10
11						0.65$							11
12								0.03$					12
13													13
14						0.23$							14
15						0.52$							15
16													16
17						0.02$							17
18													18
19													19
20													20
21													21
22						0.70$							22
23						0.85$							23
24													24
25													25
26													26
27					0.13$								27
28													28
29													29
30		$					$		$			$	30
31	0.10$		$							$	$		31
Mean	0.00$	0.00$	0.00$	0.08$	0.00$	0.12$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	
Maximum	0.10$	0.00$	0.00$	1.21$	0.13$	0.85$	0.00$	0.03$	0.00$	0.00$	0.00$	0.00$	
Minimum	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	
Total	0.10$	0.00$	0.00$	2.41$	0.13$	3.81$	0.00$	0.03$	0.00$	0.00$	0.00$	0.00$	

Summaries

Annual Mean	0.02$
Annual Total	6.48$

	Maximum	Minimum
Daily	1.21$	0.00$

Notes

All recorded data is continuous and reliable except where the following tags are used...
$ ... Daily Read

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 1107D La Tuna Debris Basin Year 2017/18
Variable 11.03 Rainfall in Inches, ALERT Transmitted Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2						0.53							2
3						0.28							3
4													4
5		0.01											5
6													6
7													7
8				0.56									8
9				1.76									9
10				0.01		0.68							10
11						0.03		0.02					11
12					0.14								12
13						0.16							13
14						0.19							14
15						0.48							15
16						0.15							16
17													17
18													18
19				0.01									19
20						0.02							20
21						0.72		0.01					21
22						0.94							22
23						0.01							23
24													24
25													25
26					0.18								26
27		0.02			0.01								27
28													28
29													29
30								0.02					30
31								0.02					31
Mean	0.00	0.00	0.00	0.08	0.01	0.14	0.00	0.00	0.00	0.00	0.00	0.00	
Maximum	0.00	0.02	0.00	1.76	0.18	0.94	0.00	0.02	0.00	0.00	0.00	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.00	0.03	0.00	2.34	0.33	4.19	0.00	0.07	0.00	0.00	0.00	0.00	

Summaries

Annual Mean	0.02
Annual Total	6.96

	Maximum	Minimum
Daily	1.76	0.00

---------- Notes ----------
All recorded data is continuous and reliable

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 465C Sepulveda Dam Year 2017/18
Variable 11.01 Rainfall in Inches, Daily manual reading Table Type Rain
Figures are for a 24-hour period

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2						0.54$							2
3						0.17$							3
4						0.03$							4
5													5
6													6
7													7
8				0.36$									8
9				1.86$									9
10				0.02$		0.20$							10
11						0.42$							11
12								0.05$					12
13					0.04$	0.04$							13
14						0.06$							14
15						0.32$							15
16													16
17													17
18										0.01$			18
19							0.01$						19
20													20
21						0.82$							21
22						0.48$							22
23						0.15$							23
24													24
25													25
26													26
27					0.13$								27
28													28
29													29
30		$							$			$	30
31	$		$								$		31
Mean	0.00$	0.00$	0.00$	0.07$	0.01$	0.10$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	
Maximum	0.00$	0.00$	0.00$	1.86$	0.13$	0.82$	0.01$	0.05$	0.00$	0.01$	0.00$	0.00$	
Minimum	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	
Total	0.00$	0.00$	0.00$	2.24$	0.17$	3.23$	0.01$	0.05$	0.00$	0.01$	0.00$	0.00$	

Summaries

Annual Mean	0.02$
Annual Total	5.71$

	Maximum	Minimum
Daily	1.86$	0.00$

---------- Notes ----------
All recorded data is continuous and reliable
except where the following tags are used...
$ ... Daily Read

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 17 Sepulveda Canyon At Mulholland - Fire Station # 109 Year 2017/18
Variable 11.03 Rainfall in Inches, ALERT Transmitted Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1						0.05		0.02					1
2						1.65							2
3						0.12							3
4													4
5													5
6													6
7													7
8				0.59									8
9				2.13									9
10				0.01		0.80							10
11						0.05		0.01					11
12								0.05					12
13						0.12							13
14						0.15							14
15						0.55							15
16						0.01							16
17		0.01											17
18										0.01			18
19							0.03						19
20						0.01							20
21						0.82							21
22						0.83							22
23						0.13							23
24													24
25													25
26					0.12								26
27		0.01											27
28													28
29													29
30								0.09					30
31													31
Mean	0.00	0.00	0.00	0.09	0.00	0.17	0.00	0.01	0.00	0.00	0.00	0.00	
Maximum	0.00	0.01	0.00	2.13	0.12	1.65	0.03	0.09	0.00	0.01	0.00	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.00	0.02	0.00	2.73	0.12	5.29	0.03	0.17	0.00	0.01	0.00	0.00	

Summaries

Annual Mean	0.02
Annual Total	8.37

	Maximum	Minimum
Daily	2.13	0.00

Notes

All recorded data is continuous and reliable

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 21B Woodland Hills Year 2017/18
Variable 11.01 Rainfall in Inches, Daily manual reading Table Type Rain
Figures are for a 24-hour period

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2		0.01$				0.68$							2
3						0.17$							3
4						0.05$							4
5													5
6		0.01$											6
7													7
8				0.37$									8
9				1.75$									9
10				0.04$		0.21$							10
11						0.31$							11
12													12
13						0.07$							13
14					0.01$	0.03$							14
15						0.54$							15
16						0.04$							16
17						0.01$							17
18													18
19							0.04$						19
20													20
21						0.97$							21
22						0.58$							22
23						0.25$							23
24													24
25													25
26													26
27		0.04$			0.13$								27
28													28
29													29
30									$			$	30
31	$		$					$		$	$		31
Mean	0.00$	0.00$	0.00$	0.07$	0.00$	0.13$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	
Maximum	0.00$	0.04$	0.00$	1.75$	0.13$	0.97$	0.04$	0.00$	0.00$	0.00$	0.00$	0.00$	
Minimum	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	
Total	0.00$	0.06$	0.00$	2.16$	0.14$	3.91$	0.04$	0.00$	0.00$	0.00$	0.00$	0.00$	

Summaries

Annual Mean	0.02$
Annual Total	6.31$

	Maximum	Minimum
Daily	1.75$	0.00$

---------- Notes ----------
All recorded data is continuous and reliable
except where the following tags are used...
$ ... Daily Read

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 735H Bell Canyon Debris Basin Year 2017/18
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1						0.08							1
2						0.67							2
3						0.12							3
4													4
5													5
6													6
7													7
8				0.43									8
9				1.81									9
10						0.55							10
11						0.08							11
12													12
13						0.08							13
14						0.24							14
15						0.24							15
16						0.08							16
17													17
18													18
19													19
20						0.04							20
21						0.98							21
22						0.94							22
23													23
24													24
25													25
26					0.08								26
27													27
28													28
29													29
30													30
31													31
Mean	0.00	0.00	0.00	0.07	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	
Maximum	0.00	0.00	0.00	1.81	0.08	0.98	0.00	0.00	0.00	0.00	0.00	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.00	0.00	0.00	2.24	0.08	4.09	0.00	0.00	0.00	0.00	0.00	0.00	

Summaries

Annual Mean	0.02
Annual Total	6.42

	Maximum	Minimum
Daily	1.81	0.00

Notes

All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 25C Northridge - LADWP Year 2017/18
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1						0.01							1
2						1.01							2
3						0.11							3
4						0.01							4
5													5
6													6
7													7
8				0.55									8
9				1.59									9
10				0.01		0.72							10
11						0.08							11
12													12
13						0.03							13
14						0.25							14
15						0.35							15
16						0.01							16
17													17
18													18
19							0.02						19
20						0.04							20
21						1.05							21
22						1.21							22
23						0.01							23
24													24
25													25
26					0.31								26
27		0.01											27
28													28
29													29
30													30
31													31
Mean	0.00	0.00	0.00	0.07	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	
Maximum	0.00	0.01	0.00	1.59	0.31	1.21	0.02	0.00	0.00	0.00	0.00	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.00	0.01	0.00	2.15	0.31	4.89	0.02	0.00	0.00	0.00	0.00	0.00	

Summaries

Annual Mean	0.02
Annual Total	7.38

	Maximum	Minimum
Daily	1.59	0.00

---------- Notes ----------
All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 33A Pacoima Dam Year 2017/18
Variable 11.01 Rainfall in Inches, Daily manual reading Table Type Rain
Figures are for a 24-hour period

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2						0.43$		T					2
3						0.84$							3
4						0.32$							4
5		0.11$											5
6													6
7		0.01$											7
8				0.01$									8
9				1.36$									9
10				0.96$									10
11				0.01$		1.05$							11
12								0.03$					12
13								T					13
14						0.37$							14
15						0.71$							15
16													16
17						0.22$							17
18													18
19													19
20				0.02$									20
21						0.05$							21
22						0.97$		0.04$					22
23						1.74$							23
24													24
25													25
26													26
27		0.04$			0.32$								27
28													28
29													29
30							$	0.01$	$			$	30
31	0.02$		$					0.05$		$	$		31
Mean	0.00$	0.01$	0.00$	0.08$	0.01$	0.22$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	
Maximum	0.02$	0.11$	0.00$	1.36$	0.32$	1.74$	0.00$	0.05$	0.00$	0.00$	0.00$	0.00$	
Minimum	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	
Total	0.02$	0.16$	0.00$	2.36$	0.32$	6.70$	0.00$	0.13$	0.00$	0.00$	0.00$	0.00$	

Summaries

Annual Mean	0.03$
Annual Total	9.69$

	Maximum	Minimum
Daily	1.74$	0.00$

Notes

All recorded data is continuous and reliable except where the following tags are used...

$ ... Daily Read
T ... Trace

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 47D Clear Creek-City School Year 2017/18
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1						0.04							1
2		0.04				2.24		0.04					2
3						0.59							3
4													4
5		0.04											5
6													6
7													7
8													8
9				1.26									9
10						0.75							10
11						0.08							11
12													12
13						0.67							13
14						0.98							14
15						0.98							15
16						0.67							16
17													17
18													18
19				0.28									19
20						0.08							20
21						0.63							21
22						1.93							22
23													23
24													24
25								0.04					25
26					0.47								26
27													27
28													28
29													29
30													30
31													31
Mean	0.00	0.00	0.00	0.05	0.02	0.31	0.00	0.00	0.00	0.00	0.00	0.00	
Maximum	0.00	0.04	0.00	1.26	0.47	2.24	0.00	0.04	0.00	0.00	0.00	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.00	0.08	0.00	1.54	0.47	9.65	0.00	0.08	0.00	0.00	0.00	0.00	

Summaries

Annual Mean	0.03
Annual Total	11.81

	Maximum	Minimum
Daily	2.24	0.00

Notes

All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 53D Colby's Ranch Year 2017/18
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2						0.63		0.04					2
3						0.24							3
4													4
5		0.04											5
6													6
7													7
8				1.26									8
9				2.05									9
10				0.04		0.35							10
11						0.04							11
12													12
13						0.24							13
14						0.31							14
15						0.83							15
16						0.31							16
17						0.04							17
18													18
19				0.08									19
20						0.08							20
21						0.63							21
22						1.42							22
23						0.08							23
24													24
25													25
26					0.20								26
27					0.04								27
28					0.04								28
29													29
30													30
31													31
Mean	0.00	0.00	0.00	0.11	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	
Maximum	0.00	0.04	0.00	2.05	0.20	1.42	0.00	0.04	0.00	0.00	0.00	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.00	0.04	0.00	3.43	0.28	5.20	0.00	0.04	0.00	0.00	0.00	0.00	

Summaries

Annual Mean	0.02
Annual Total	8.98

	Maximum	Minimum
Daily	2.05	0.00

Notes

All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 54C Loomis Ranch-Alder Creek Year 2017/18
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1								0.04					1
2						0.16		0.08					2
3						0.08							3
4													4
5		0.08											5
6													6
7													7
8				1.10									8
9				1.69									9
10				0.04		0.39							10
11						0.04							11
12													12
13						0.28							13
14					0.04	0.28							14
15						0.59							15
16						0.20					0.63		16
17						0.04							17
18													18
19													19
20						0.04							20
21						0.87							21
22						1.22							22
23						0.04							23
24													24
25													25
26													26
27					0.31								27
28													28
29													29
30													30
31													31
Mean	0.00	0.00	0.00	0.09	0.01	0.14	0.00	0.00	0.00	0.00	0.02	0.00	
Maximum	0.00	0.08	0.00	1.69	0.31	1.22	0.00	0.08	0.00	0.00	0.63	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.00	0.08	0.00	2.83	0.35	4.21	0.00	0.12	0.00	0.00	0.63	0.00	

Summaries

Annual Mean	0.02
Annual Total	8.23

	Maximum	Minimum
Daily	1.69	0.00

Notes
All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 210C Brand Park Year 2017/18
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2						0.52							2
3						0.14							3
4													4
5													5
6													6
7													7
8				0.37			0.01						8
9				1.38									9
10						0.85							10
11						0.03		0.05					11
12					0.13			0.07					12
13						0.16							13
14						0.67							14
15						0.58							15
16						0.06							16
17													17
18													18
19				0.01									19
20													20
21						0.55		0.08					21
22						0.66							22
23						0.08							23
24													24
25													25
26					0.11								26
27					0.08								27
28													28
29													29
30								0.16					30
31	0.02							0.01					31
Mean	0.00	0.00	0.00	0.06	0.01	0.14	0.00	0.01	0.00	0.00	0.00	0.00	
Maximum	0.02	0.00	0.00	1.38	0.13	0.85	0.01	0.16	0.00	0.00	0.00	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.02	0.00	0.00	1.76	0.32	4.30	0.01	0.37	0.00	0.00	0.00	0.00	

Summaries

Annual Mean	0.02
Annual Total	6.78

	Maximum	Minimum
Daily	1.38	0.00

Notes

All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 251C La Crescenta Year 2017/18
Variable 11.01 Rainfall in Inches, Daily manual reading Table Type Rain
Figures are for a 24-hour period

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1								0.05$					1
2		T				1.09$		0.02$					2
3						A		T					3
4		T				0.65A							4
5		T											5
6													6
7													7
8				0.35$									8
9				2.45$									9
10				0.05$		A							10
11						0.99A		0.04$					11
12								A					12
13					0.02$	0.10$		0.19A					13
14					T	0.63$							14
15						1.38$							15
16						T							16
17		T				A							17
18						0.24A							18
19				0.03$			T						19
20						T							20
21			T			0.65$		0.17$					21
22						1.04$		0.05$					22
23						0.28$		0.01$					23
24													24
25						T							25
26													26
27		0.02$			0.21$								27
28					T								28
29													29
30	0.05$							0.10$	$			$	30
31	0.09$							0.07$		$	$		31
Mean	0.00$	0.00$	0.00T	0.09$	0.01$	0.23A	0.00T	0.02A	0.00$	0.00$	0.00$	0.00$	
Maximum	0.09$	0.02$	0.00T	2.45$	0.21$	1.38A	0.00T	0.19A	0.00$	0.00$	0.00$	0.00$	
Minimum	0.00$	0.00$	0.00T	0.00$	0.00$	0.00A	0.00T	0.00A	0.00$	0.00$	0.00$	0.00$	
Total	0.14$	0.02$	0.00T	2.88$	0.23$	7.05A	0.00T	0.70A	0.00$	0.00$	0.00$	0.00$	

Summaries

Annual Mean	0.03A
Annual Total	11.02A

	Maximum	Minimum
Daily	2.45A	0.00A

Notes

All recorded data is continuous and reliable except where the following tags are used...

$ ... Daily Read
A ... Accumulated Data
T ... Trace

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site AL301 Brown's Canyon Year 2017/18
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1						[ ]M		0.04					1
2						[ ]M							2
3						[ ]M							3
4													4
5		0.04											5
6													6
7													7
8				0.91									8
9				0.94									9
10						1.02							10
11						0.20		0.08					11
12								0.28					12
13						0.20							13
14						0.55							14
15						0.20							15
16						0.31							16
17													17
18													18
19													19
20						0.04							20
21						1.18							21
22						1.73							22
23						0.08							23
24								0.04					24
25													25
26					0.12								26
27		0.08											27
28													28
29													29
30								0.04					30
31													31
Mean	0.00	0.00	0.00	0.06	0.00	0.20	0.00	0.02	0.00	0.00	0.00	0.00	
Maximum	0.00	0.08	0.00	0.94	0.12	1.73	0.00	0.28	0.00	0.00	0.00	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.00	0.12	0.00	1.85	0.12	5.51	0.00	0.47	0.00	0.00	0.00	0.00	
Missing Days	0	0	0	0	0	3	0	0	0	0	0	0	

Summaries

Annual Mean	0.02
Annual Total	8.07
Missing Days	4

	Maximum	Minimum
Daily	1.73	0.00

Notes

All recorded data is continuous and reliable except where the following tags are used...
M ... Missing Data or Malfunction
[ ] Data Not Recorded

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 1222 Northridge - Garland Year 2017/18
Variable 11.01 Rainfall in Inches, Daily manual reading Table Type Rain
Figures are for a 24-hour period

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2						1.50$							2
3						0.30$							3
4						0.04$							4
5		0.06$											5
6													6
7													7
8				0.56$									8
9				1.74$									9
10						0.30$							10
11						0.67$		0.03$					11
12								0.04$					12
13					0.05$	0.06$							13
14						0.25$							14
15						0.54$							15
16													16
17						0.07$							17
18													18
19							0.03$						19
20			0.01$										20
21						0.99$							21
22						0.92$							22
23						0.56$							23
24													24
25													25
26													26
27					0.30$								27
28													28
29													29
30								0.02$	$			$	30
31	$									$	$		31
Mean	0.00$	0.00$	0.00$	0.07$	0.01$	0.20$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	
Maximum	0.00$	0.06$	0.01$	1.74$	0.30$	1.50$	0.03$	0.04$	0.00$	0.00$	0.00$	0.00$	
Minimum	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	
Total	0.00$	0.06$	0.01$	2.30$	0.35$	6.20$	0.03$	0.09$	0.00$	0.00$	0.00$	0.00$	

Summaries

Annual Mean	0.02$
Annual Total	9.04$

	Maximum	Minimum
Daily	1.74$	0.00$

Notes

All recorded data is continuous and reliable except where the following tags are used...
$ ... Daily Read

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works HYDAY V139 Output 11/30/2020

Site 1074 Little Gleason Year 2017/18
Variable 11.03 Rainfall in Inches, ALERT Transmitted Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1						0.20							1
2		0.04				[ ]M		0.04					2
3						[ ]M							3
4						0.16							4
5		0.20											5
6													6
7													7
8				2.01									8
9				2.13									9
10						0.83							10
11						0.12							11
12													12
13						0.67							13
14						1.10							14
15						0.43							15
16						0.24							16
17						0.28			0.04				17
18													18
19				0.28									19
20						0.08							20
21						0.87							21
22						2.36							22
23						0.12							23
24													24
25													25
26													26
27		0.04			0.04								27
28					0.12								28
29													29
30													30
31	0.04												31
Mean	0.00	0.01	0.00	0.14	0.01	0.26	0.00	0.00	0.00	0.00	0.00	0.00	
Maximum	0.04	0.20	0.00	2.13	0.12	2.36	0.00	0.04	0.04	0.00	0.00	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.04	0.28	0.00	4.41	0.16	7.44	0.00	0.04	0.04	0.00	0.00	0.00	
Missing Days	0	0	0	0	0	2	0	0	0	0	0	0	

Summaries

Annual Mean	0.03
Annual Total	12.40
Missing Days	2

	Maximum	Minimum
Daily	2.36	0.00

Notes
All recorded data is continuous and reliable
except where the following tags are used...
M ... Missing Data or Malfunction

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works HYDAY V129 Output 07/31/2018

Site AL464 Pacoima Wash Spreading Grounds Head Works Year 2017/18
Variable 11.03 Rainfall in Inches, ALERT Transmitted Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1						0.02		0.01			[ ]	[ ]	1
2		0.02				1.38				[ ]	[ ]	[ ]	2
3						0.23				[ ]	[ ]	[ ]	3
4										[ ]	[ ]	[ ]	4
5		0.06								[ ]	[ ]	[ ]	5
6										[ ]	[ ]	[ ]	6
7										[ ]	[ ]	[ ]	7
8				0.59						[ ]	[ ]	[ ]	8
9				1.52						[ ]	[ ]	[ ]	9
10						0.67				[ ]	[ ]	[ ]	10
11						0.03				[ ]	[ ]	[ ]	11
12								0.01		[ ]	[ ]	[ ]	12
13						0.08				[ ]	[ ]	[ ]	13
14						0.26				[ ]	[ ]	[ ]	14
15						0.40				[ ]	[ ]	[ ]	15
16						0.01				[ ]	[ ]	[ ]	16
17										[ ]	[ ]	[ ]	17
18										[ ]	[ ]	[ ]	18
19										[ ]	[ ]	[ ]	19
20			0.01			0.05				[ ]	[ ]	[ ]	20
21						0.85				[ ]	[ ]	[ ]	21
22						0.90				[ ]	[ ]	[ ]	22
23						0.08				[ ]	[ ]	[ ]	23
24										[ ]	[ ]	[ ]	24
25										[ ]	[ ]	[ ]	25
26					0.22					[ ]	[ ]	[ ]	26
27		0.02								[ ]	[ ]	[ ]	27
28										[ ]	[ ]	[ ]	28
29										[ ]	[ ]	[ ]	29
30										[ ]	[ ]	[ ]	30
31	0.01									[ ]	[ ]		31
Mean	0.00	0.00	0.00	0.07	0.01	0.16	0.00	0.00	0.00	0.00	[ ]	[ ]	
Maximum	0.01	0.06	0.01	1.52	0.22	1.38	0.00	0.01	0.00	0.00	[ ]	[ ]	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[ ]	[ ]	
Total	0.01	0.10	0.01	2.11	0.22	4.96	0.00	0.02	0.00	0.00	[ ]	[ ]	
Missing Days	0	0	0	0	0	0	0	0	0	30	31	30	

Summaries

Annual Mean	0.03
Annual Total	7.43
Missing Days	91

	Maximum	Minimum
Daily	1.52	0.00

Notes

All recorded data is continuous and reliable except where the following tags are used...

[ ] Data Not Recorded

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Appendix C

Components of Los Angeles River Flow

UPPER LOS ANGELES RIVER AREA: COMPONENTS OF LOS ANGELES RIVER FLOW		
2017-18 WATER YEAR		
TOTAL FLOW AT GAGE F-57C-R		F-57C-R: Storm, Reclaimed, Industrial, Rising Ground Water
		F300-R: Storm, Tillman, Industrial Waste, and Rising Water
Total:	94,816	E285-R :Storm, Burbank WRP, Industrial Waste
		F252-R: Storm, Rising Water
I. RECLAIMED WATER DISCHARGED TO L.A. RIVER IN ULARA		
Tillman:	28,925	: Record
L.A.-Glendale:	10,949	: Record
Burbank WRP:	3,548	: Record
Total:	**43,422**	
II. INDUSTRIAL WATER and STORM FLOWS DISCHARGED TO L.A. RIVER IN ULARA		
Upstream of F300-R		
Industrial Water	6	: From F300-R separation of flow
F168	1,406	
F118	1,932	
Storm Flows @300	27,281	Storm flows less F168 and F118
	30,625	
Between F300-R and E-285		
Burbank OU	17	Burbank Operable Unit
MTA	29	
Storm Drains and Unaccounted water	6,415	8.9 cfs assumes 6,415 AF
Headworks:	0	: pilot project record
Western Drain:	2,658	: From E285-R separation of flow
Storm Flows @285	1,240	
	10,359	
Between E-285 and F57C-R		
Storm Flows, DryWeather Flow, perennial stream flow, VPWTP @ 252	1,679	: From F252-R separation of flow
Glendale Operable Unit	665	
Eagle Rock Blow Off	0	
Pollock Treatment	0	
Sycamore Canyon	1,100	Estimated from historic flows
Storm Drains and Unaccounted water	5,265	7.3 cfs assumes 5,265 AF
Total Storm + Industrial Flows at F-57C	**8,709**	
Total Part II	**49,693**	
III. RISING WATER IN L.A. RIVER IN ULARA		
Total:	1,701	: See Section 2.3 of the Watermaster's Report

Appendix D

Water Quality Data

REPRESENTATIVE MINERAL ANALYSES OF WATER

Well Number or Source	Date Sampled	Spec. Cond. µS/cm	Mineral Constituents in milligrams per liter (mg/l)												TDS mg/l	Hardness as $CaCO_3$ mg/l
			pH	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	NO_3	F	B		
Imported Water																
Colorado River Water at Lake Havasu	2017/18 FY	975	8.2	74	26	92	4.5	0	159	232	89	1.4	0.3	0.1	605	284
State Water Project at Joseph Jensen Filtration Plant (efffluent)	2017/18 FY	488	8.4	23	11	54	2.8	0	90	54	65	2.3	0.7	0.2	271	100
Colorado River/ State Water Project Blend Point at the Plant (effluent)	2017/18 FY	665	8.3	40	17	70	3.4	0	98	128	73	1.6	0.8	0.1	392	162
LA Aqueduct No 1. Influent	2017/18	308	8.3	26.8	7.22	40.6	4.87	-	142	31	27	-	0.6	0.41	218	95
LA Aqueduct Filtration Plant Influent	2017/18	306	8.1	-	6.4	36	4.4	2.8	117	24	24	0.1	0.4	0.4	186	86
Surface Water																
Tillman Rec. Plant Discharge to LA River	2017/18 FY	-	7.1	-	-	-	-	-	-	81	113	5.4	0.7	0.5	499	123
Los Angeles River at Arroyo Seco	9/95	981	8.0	68	24	97	9.8	ND	171	191	108	7.4	0.3	0.6	666	270
LA/Glendale Rec. Plant Discharge to LA River	2017/18 FY	-	7.3	-	-	-	-	-	-	121	140	4.5	0.6	0.4	645	209
Groundwater																
(San Fernando Basin - Western Portion)																
4757C (Reseda No. 6) Well Destroyed in 2014	2/19/2014	1020	7.2	125	31	43	2.7	ND	322	188	35	ND	0.3	0.2	684	439
(San Fernando Basin - Eastern Portion)																
3800 (No. Hollywood No. 33)	2016/17	-	7.6	76	255	121	4.4	-	212	327	64	0.8	0.4	0.5	763	-
3851C VO-8/Burbank No. 10	4/4/2018	740	7.7	84	22	30	4.5	-	-	75	31	22	0.4	-	430	301
Glendale OU GN-1	9/13/2018	930	7.7	110	28	46	4.8	<2	270	150	-	32	0.4	0.2	580	390
(San Fernando Basin - L.A. Narrows)																
3959E (Pollock No. 6)	11/29/2016	900	6.98	99	35	55	2.9	-	291	138	83	8.9	0.3	0.2	624	392
(Pollock No. 6)	2017/18	-	7.03	-	-	-	-	-	-	-	-	9.2	-	-	-	-
(Sylmar Basin)																
4840K (Mission No. 6)	7/15/2014	720	7.41	78	16	39	5.2	ND	234	95	42	-	0.3	0.2	444	261
(Mission No. 6)	6/14/2018	-	7.58	-	-	-	-	-	189	60	33	1.9	0.3	0.1	332	177
5969 (San Fernando No. 4A)	1/31/2018	570	7.7	64	12	32	4.5	ND	210	52	24	32	0.2	0.1	360	210
(Verdugo Basin)																
3971 (Glorietta No. 3)	1/18/2018	1000	6.8	106	37	47	3.4	ND	210	140	-	8.7	0.2	-	660	417
5069F (CVWD No. 14)	2/13/2018	818	7.4	90	31	34	3.2	ND	200	120	76	9.5	0.2	ND	520	350

Appendix E

EPA Shallow Zone Contamination Maps

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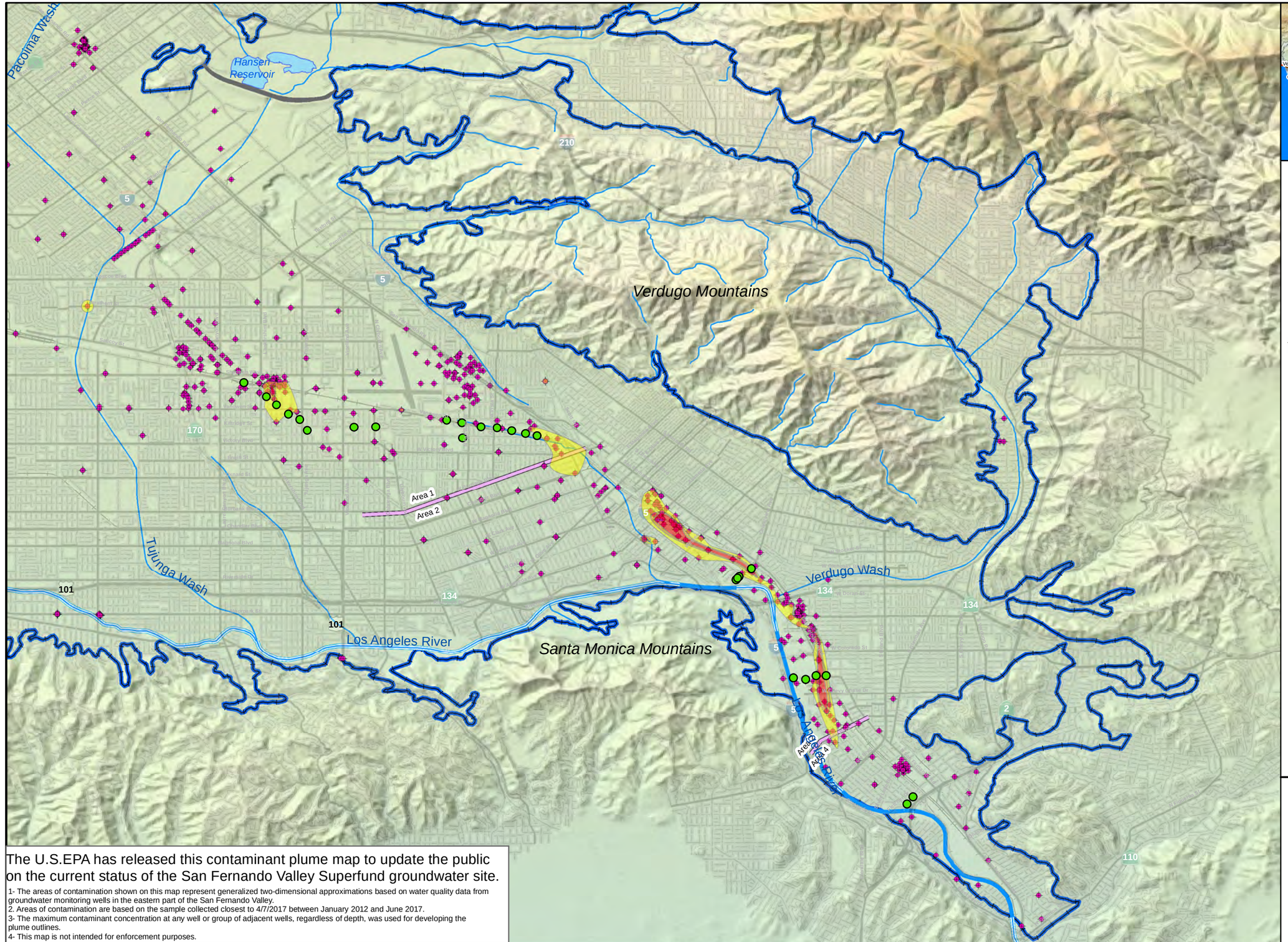

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

Cr6 Concentration

All contours approximate

- >1000 µg/L
- 100 - 999 µg/L
- 50 - 99 µg/L
- 10 - 49 µg/L

- Cr6 - Hexavalent Chromium
-OU - Operable Unit
-µg/L - micrograms per liter
-Hexavalent Chromium currently does not have a maximum contaminant level (MCL). The former MCL was 10 µg/L.
-The MCL for Total Chromium is 50 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.5 1 2 Miles

The U.S.EPA has released this contaminant plume map to update the public on the current status of the San Fernando Valley Superfund groundwater site.

1- The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality data from groundwater monitoring wells in the eastern part of the San Fernando Valley.
2. Areas of contamination are based on the sample collected closest to 4/7/2017 between January 2012 and June 2017.
3- The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for developing the plume outlines.
4- This map is not intended for enforcement purposes.

Hexavalent Chromium Contamination in Groundwater Eastern San Fernando Valley

San Fernando Valley Superfund Site

OTIE

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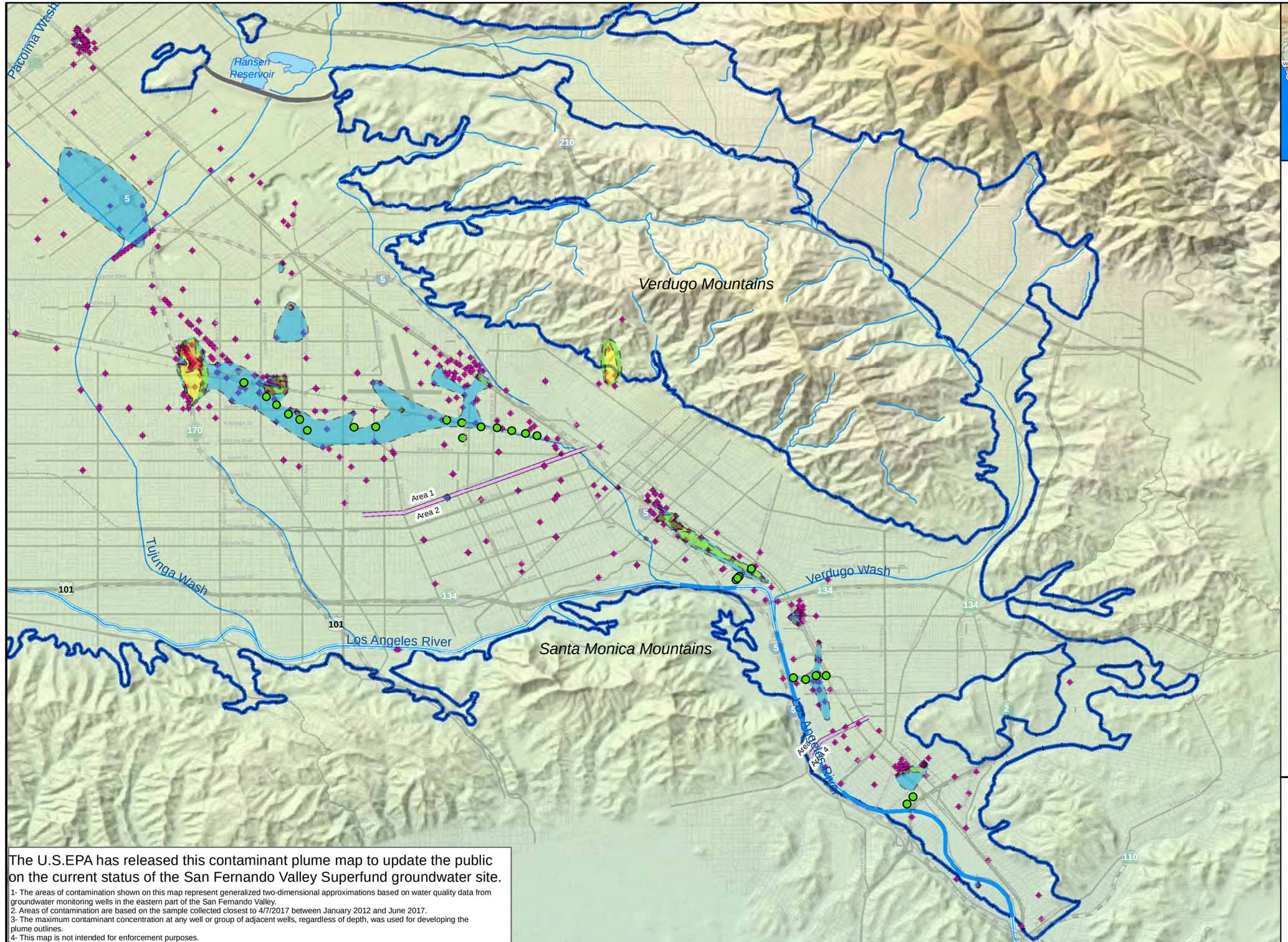

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Airports
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

1,4-Dioxane Concentration

All contours approximate

- >100 µg/L
- 50 - 99 µg/L
- 10 - 49 µg/L
- 3 - 9.9 µg/L
- 1 - 2.9 µg/L

-The Notification Level for 1,4-Dioxane is 1 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.5 1 2 Miles

1,4-Dioxane Contamination in Groundwater Eastern San Fernando Valley

San Fernando Valley Superfund Site

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2. Areas of contamination are based on the sample collected closest to 4/7/2017 between January 2012 and June 2017.
3- The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for developing the plume outlines.
4- This map is not intended for enforcement purposes.

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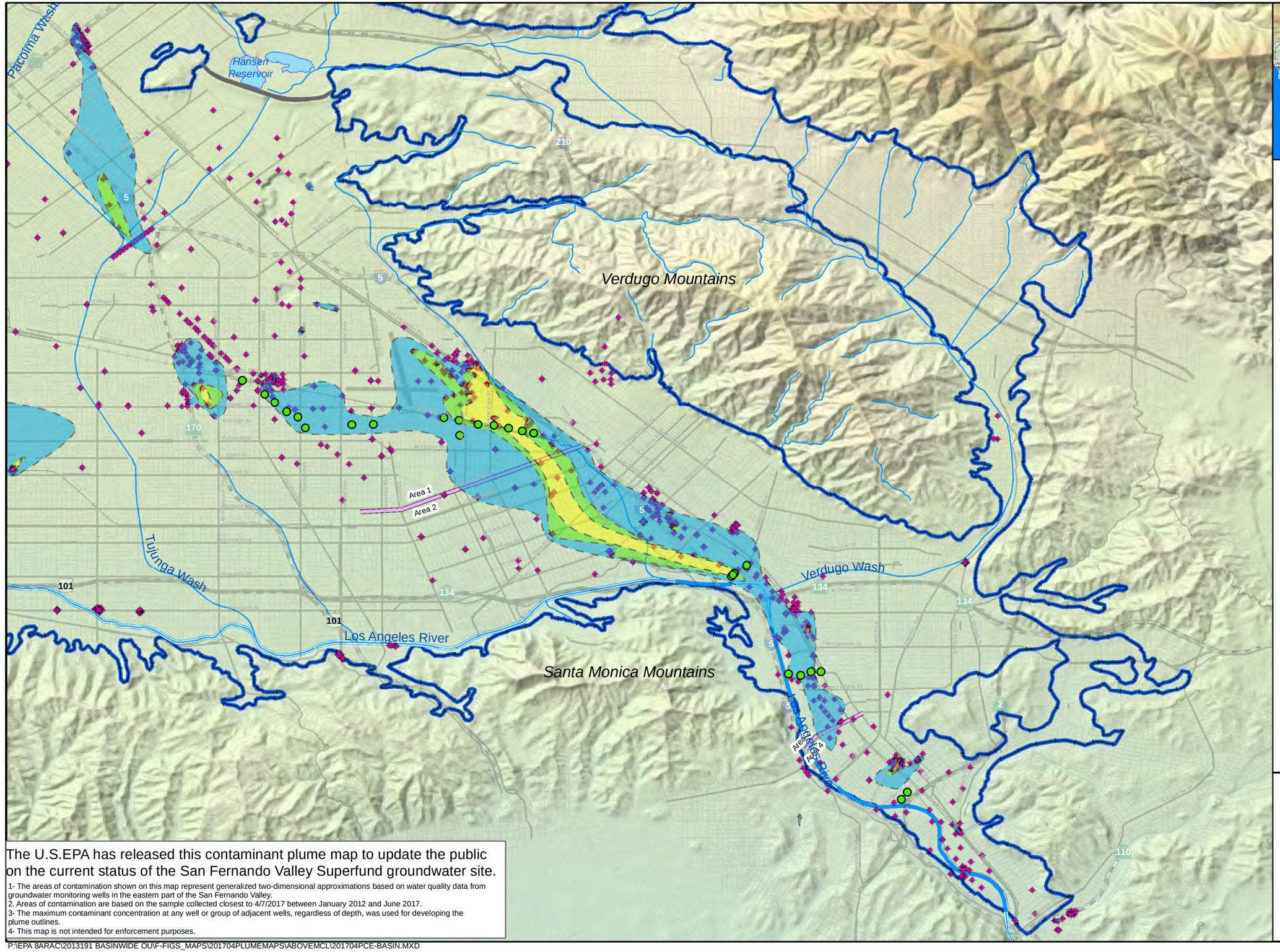

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

PCE Concentration

All contours approximate

- >1000 µg/L
- 500-999 µg/L
- 100-499 µg/L
- 50-99 µg/L
- 5-49 µg/L

- PCE - Tetrachloroethene
-OU - Operable Unit
-µg/L - micrograms per liter
-The Maximum Contaminant Level (MCL) for PCE is 5 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.5 1 2 Miles

Tetrachloroethene (PCE) Contamination in Groundwater Eastern San Fernando Valley

San Fernando Valley Superfund Site

The U.S.EPA has released this contaminant plume map to update the public on the current status of the San Fernando Valley Superfund groundwater site.

1- The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality data from groundwater monitoring wells in the eastern part of the San Fernando Valley.
2. Areas of contamination are based on the sample collected closest to 4/7/2017 between January 2012 and June 2017.
3- The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for developing the plume outlines.
4- This map is not intended for enforcement purposes.

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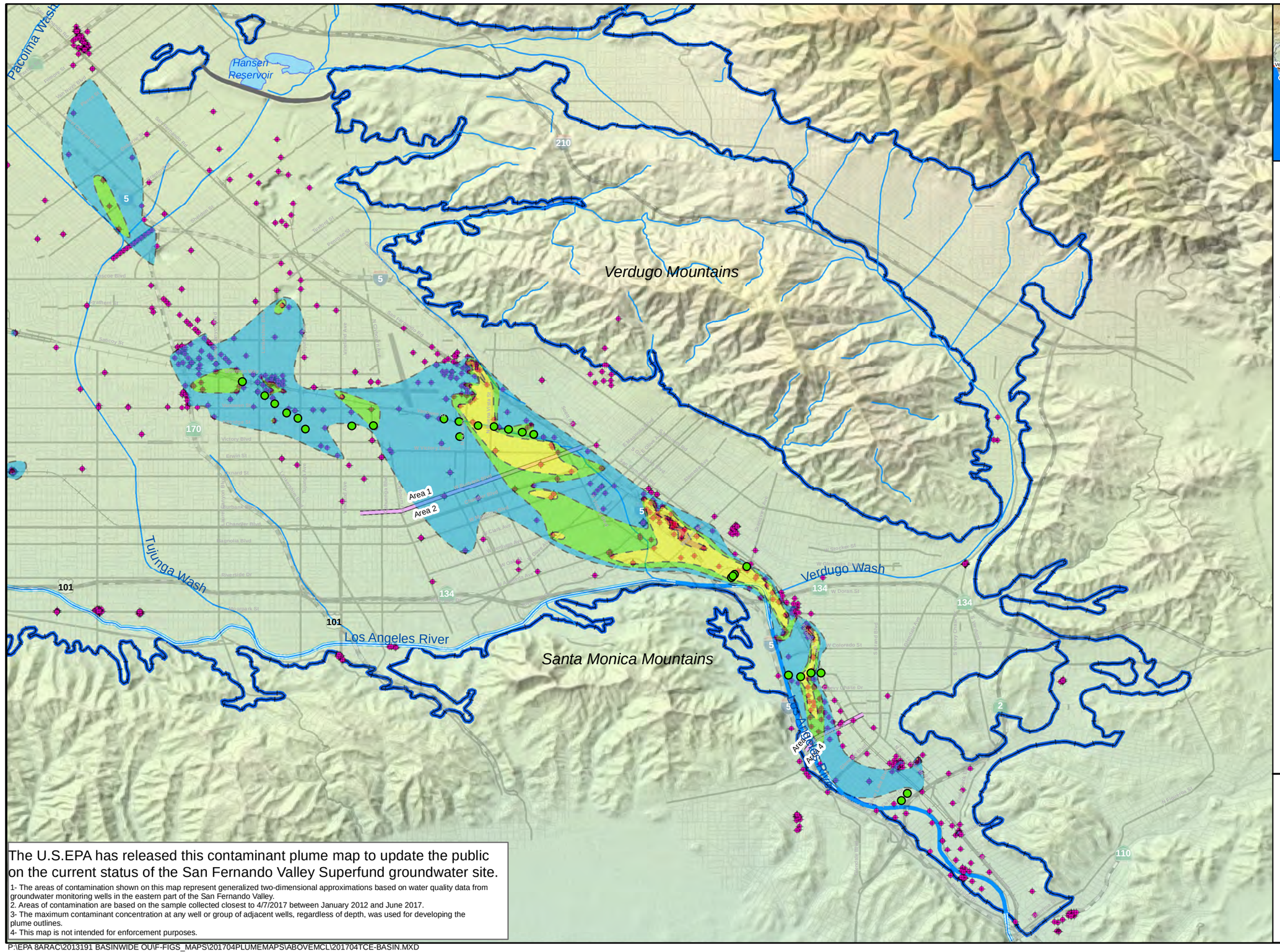

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

TCE concentration

All contours approximate

- >1000 µg/L
- 500-999 µg/L
- 100-499 µg/L
- 50-99 µg/L
- 5-49 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-TCE - Trichloroethene
-The Maximum Contaminant Level (MCL) for TCE is 5 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.5 1 2 Miles

The U.S.EPA has released this contaminant plume map to update the public on the current status of the San Fernando Valley Superfund groundwater site.

1- The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality data from groundwater monitoring wells in the eastern part of the San Fernando Valley.
2. Areas of contamination are based on the sample collected closest to 4/7/2017 between January 2012 and June 2017.
3- The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for developing the plume outlines.
4- This map is not intended for enforcement purposes.

Trichloroethene (TCE) Contamination in Groundwater Eastern San Fernando Valley

San Fernando Valley Superfund Site

OTIE

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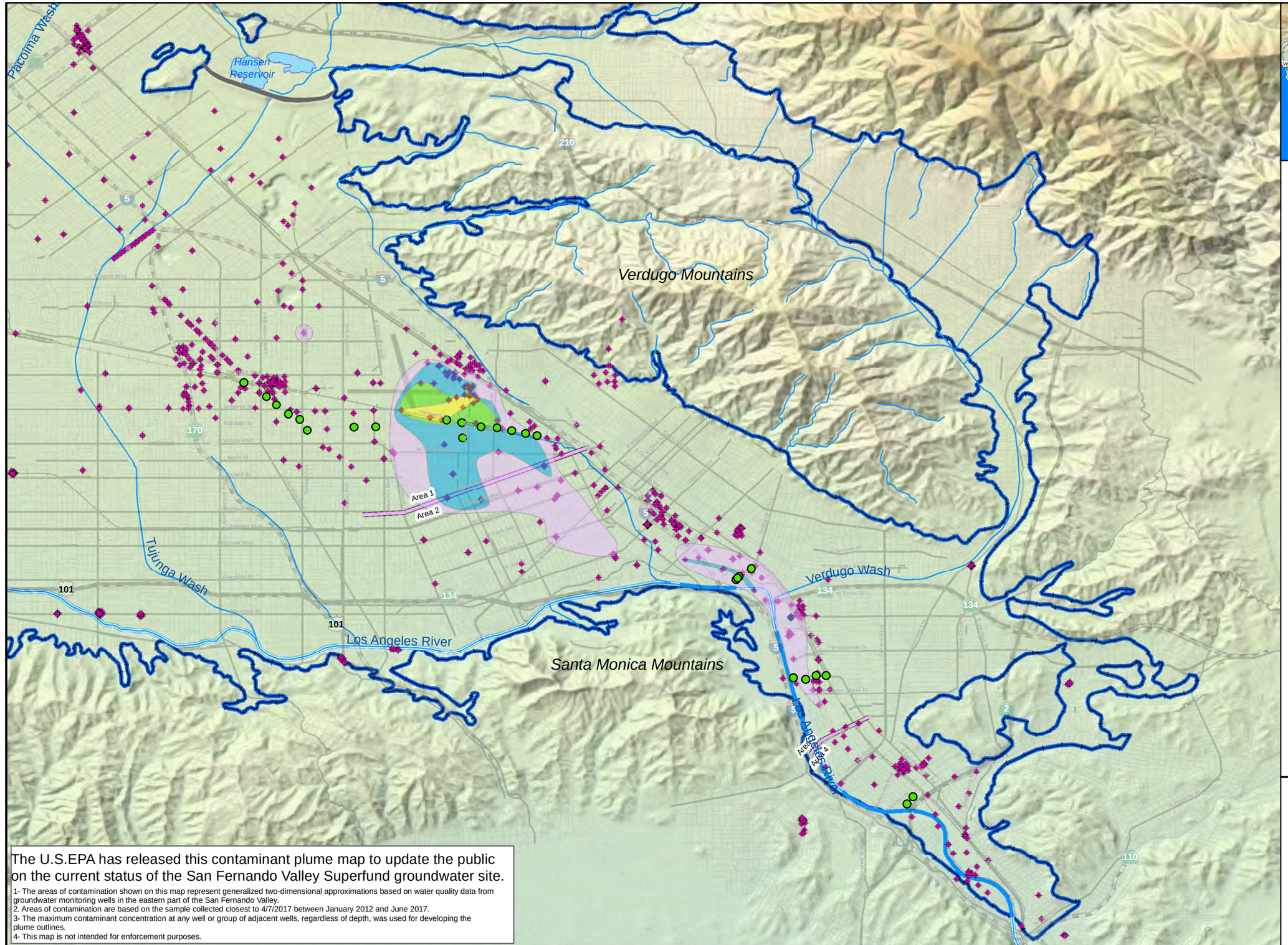

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

1,2,3-TCP Concentration

All contours approximate

- >50 - 99 µg/L
- 5 - 50 µg/L
- 0.5 - 5 µg/L
- 0.05 - 0.49 µg/L
- 0.005 - 0.049 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-1,2,3-TCP - 1,2,3-Trichloropropane
-The Maximum Contaminant Level (MCL) for 1,2,3-TCP is 0.005 µg/L..
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.5 1 2 Miles

The U.S.EPA has released this contaminant plume map to update the public on the current status of the San Fernando Valley Superfund groundwater site.

1- The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality data from groundwater monitoring wells in the eastern part of the San Fernando Valley.
2. Areas of contamination are based on the sample collected closest to 4/7/2017 between January 2012 and June 2017.
3- The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for developing the plume outlines.
4- This map is not intended for enforcement purposes.

1,2,3-Trichloropropane Contamination in Groundwater Eastern San Fernando Valley

San Fernando Valley Superfund Site

OTIE

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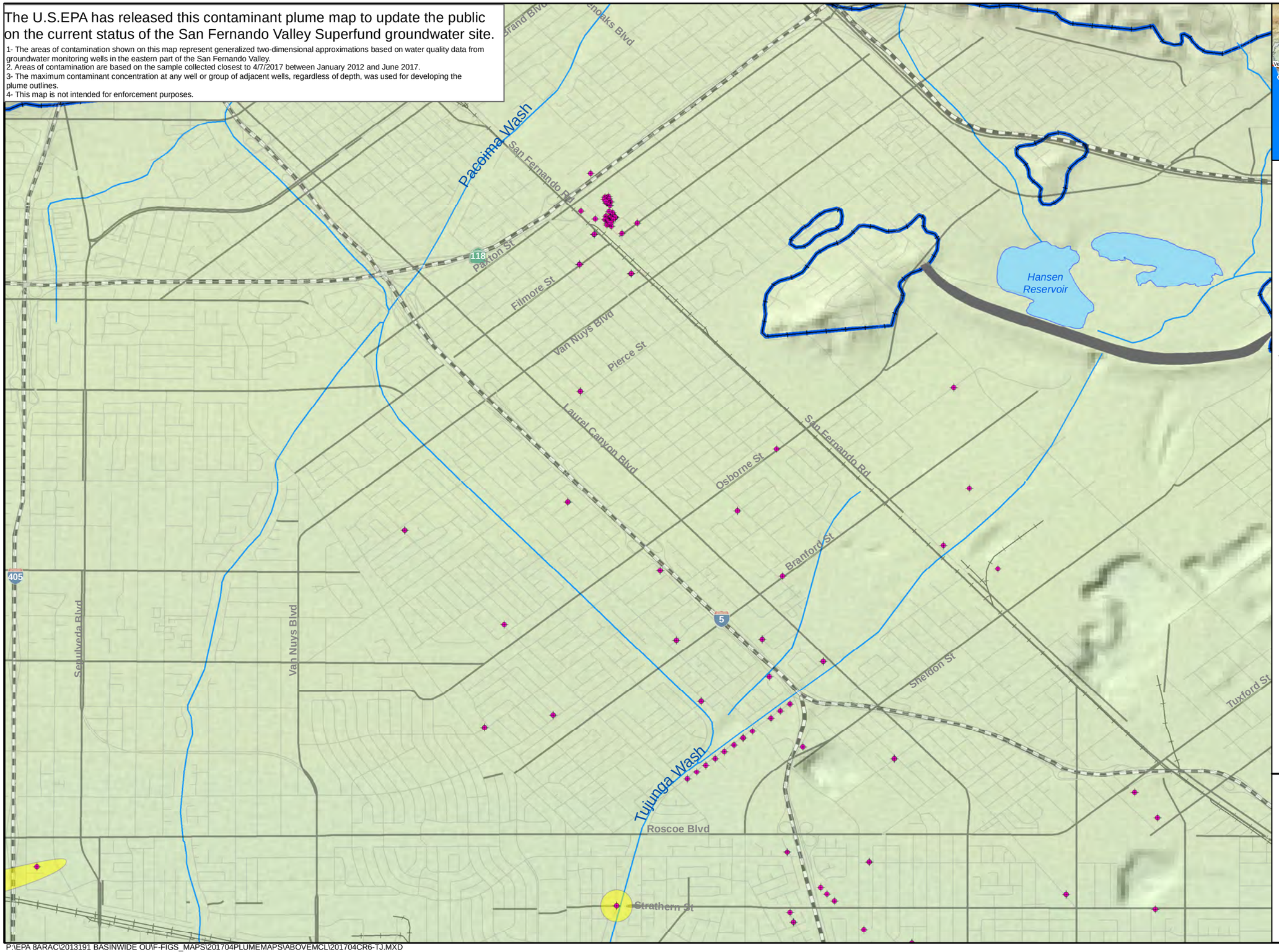
The U.S.EPA has released this contaminant plume map to update the public on the current status of the San Fernando Valley Superfund groundwater site.

1- The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality data from groundwater monitoring wells in the eastern part of the San Fernando Valley.
2. Areas of contamination are based on the sample collected closest to 4/7/2017 between January 2012 and June 2017.
3- The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for developing the plume outlines.
4- This map is not intended for enforcement purposes.



Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

Cr6 Concentration

All contours approximate

- >1000 µg/L
- 100 - 999 µg/L
- 50 - 99 µg/L
- 10 - 49 µg/L

- Cr6 - Hexavalent Chromium
-OU - Operable Unit
-µg/L - micrograms per liter
-Hexavalent Chromium currently does not have a maximum contaminant level (MCL). The former MCL was 10 µg/L.
-The MCL for Total Chromium is 50 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

Hexavalent Chromium Contamination in Groundwater Tujunga Area

San Fernando Valley Superfund Site

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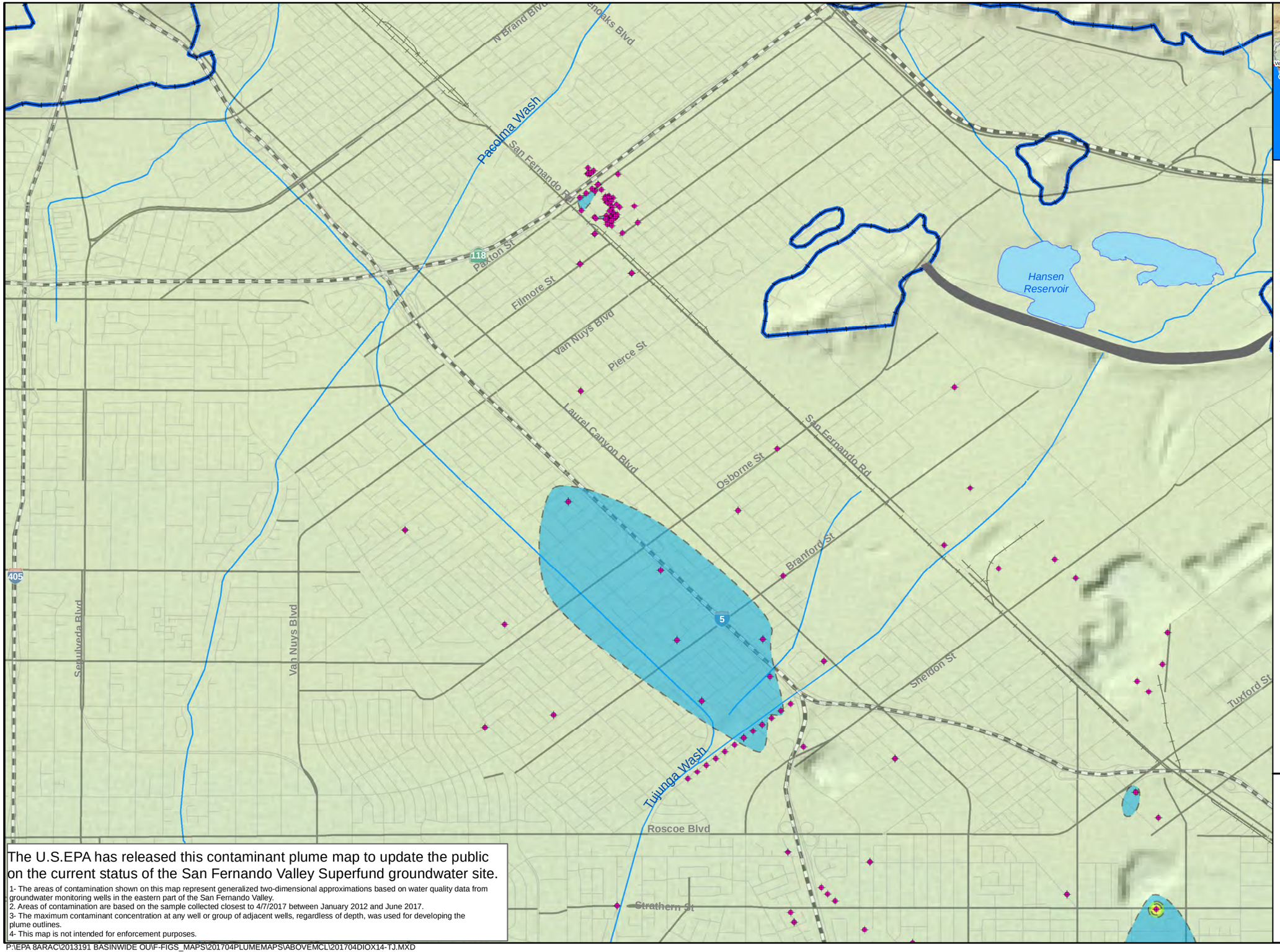

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

Estimated 1,4-Dioxane

Concentration

- >100 µg/L
- 50 - 99 µg/L
- 10 - 49 µg/L
- 3 - 9.9 µg/L
- 1 - 2.9 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-The Notification Level for 1,4-Dioxane is 1 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

The U.S.EPA has released this contaminant plume map to update the public on the current status of the San Fernando Valley Superfund groundwater site.

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3- The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for developing the plume outlines.
4- This map is not intended for enforcement purposes.

1,4-Dioxane Contamination in Groundwater Tujunga Area

San Fernando Valley Superfund Site

OTIE

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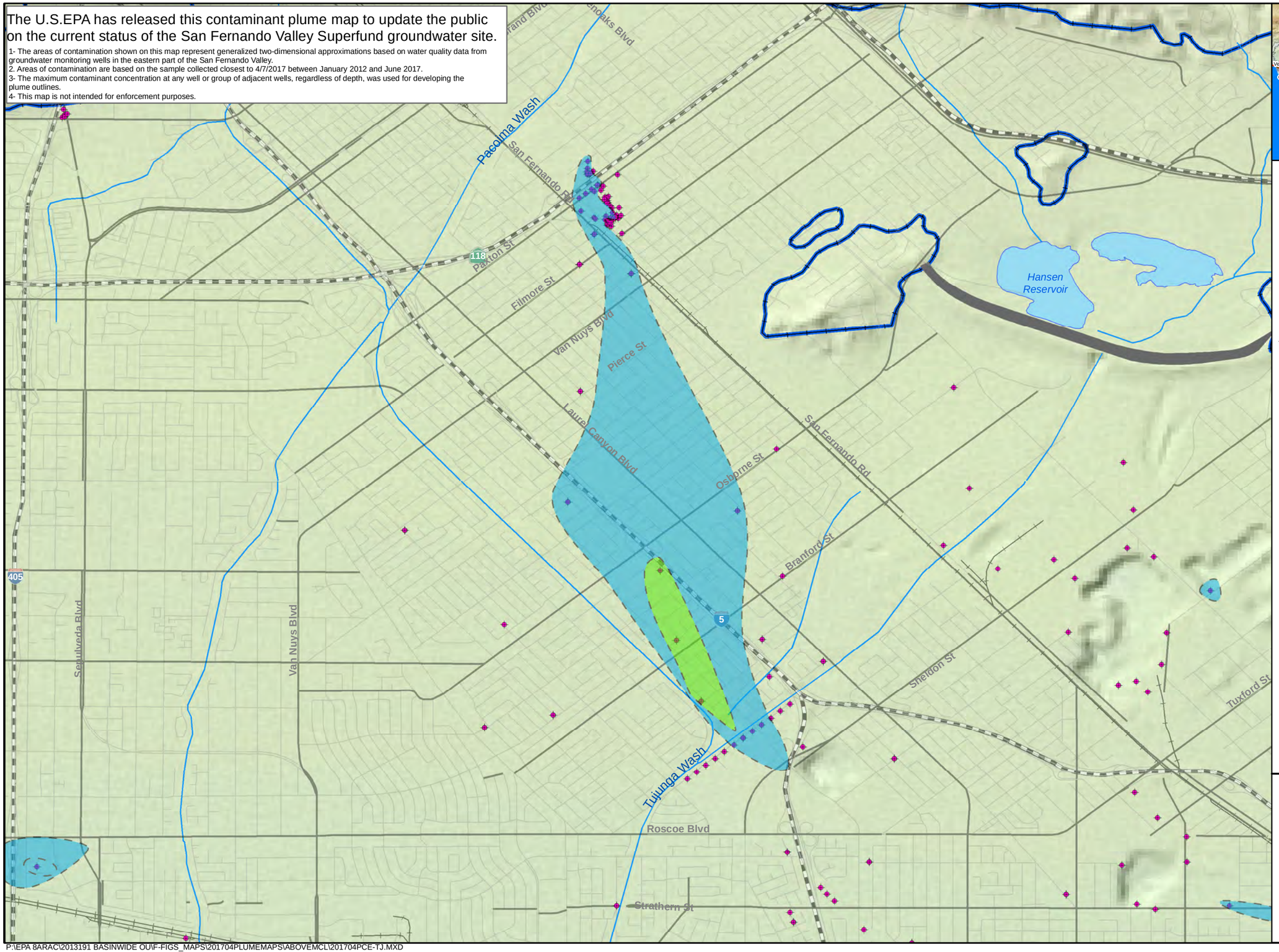

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

PCE Concentration

All contours approximate

- >1000 µg/L
- 500-999 µg/L
- 100-499 µg/L
- 50-99 µg/L
- 5-49 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-PCE - Tetrachloroethene
-The Maximum Contaminant Level (MCL) for PCE is 5 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

Tetrachloroethene (PCE) Contamination in Groundwater Tujunga Area

San Fernando Valley Superfund Site

OTIE

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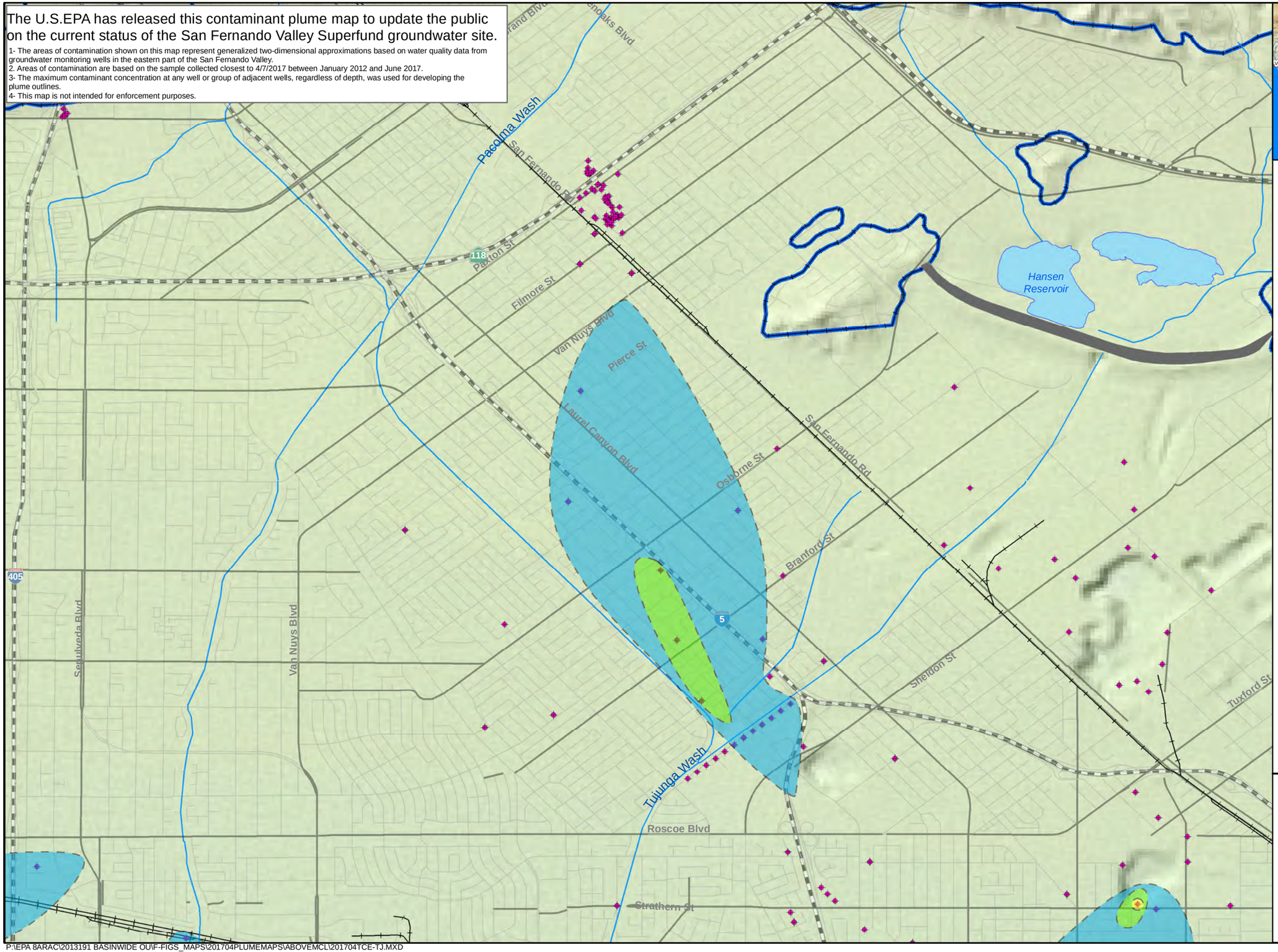

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Railroads
- Groundwater Basin Boundary

TCE concentration

All contours approximate

- >1000 µg/L
- 500-999 µg/L
- 100-499 µg/L
- 50-99 µg/L
- 5-49 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-TCE - Trichloroethene
-The Maximum Contaminant Level (MCL) for TCE is 5 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

Trichloroethene (TCE) Contamination in Groundwater Tujunga Area

San Fernando Valley Superfund Site

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Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

1,2,3-TCP Concentration

All contours approximate

- >50 - 99 µg/L
- 5 - 50 µg/L
- 0.5 - 5 µg/L
- 0.05 - 0.49 µg/L
- 0.005 - 0.049 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
1,2,3-TCP - 1,2,3-Trichloropropane
-The Maximum Contaminant Level (MCL) for 1,2,3-TCP is 0.005 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

1,2,3-Trichloropropane Contamination in Groundwater Tujunga Area

San Fernando Valley Superfund Site

OTIE

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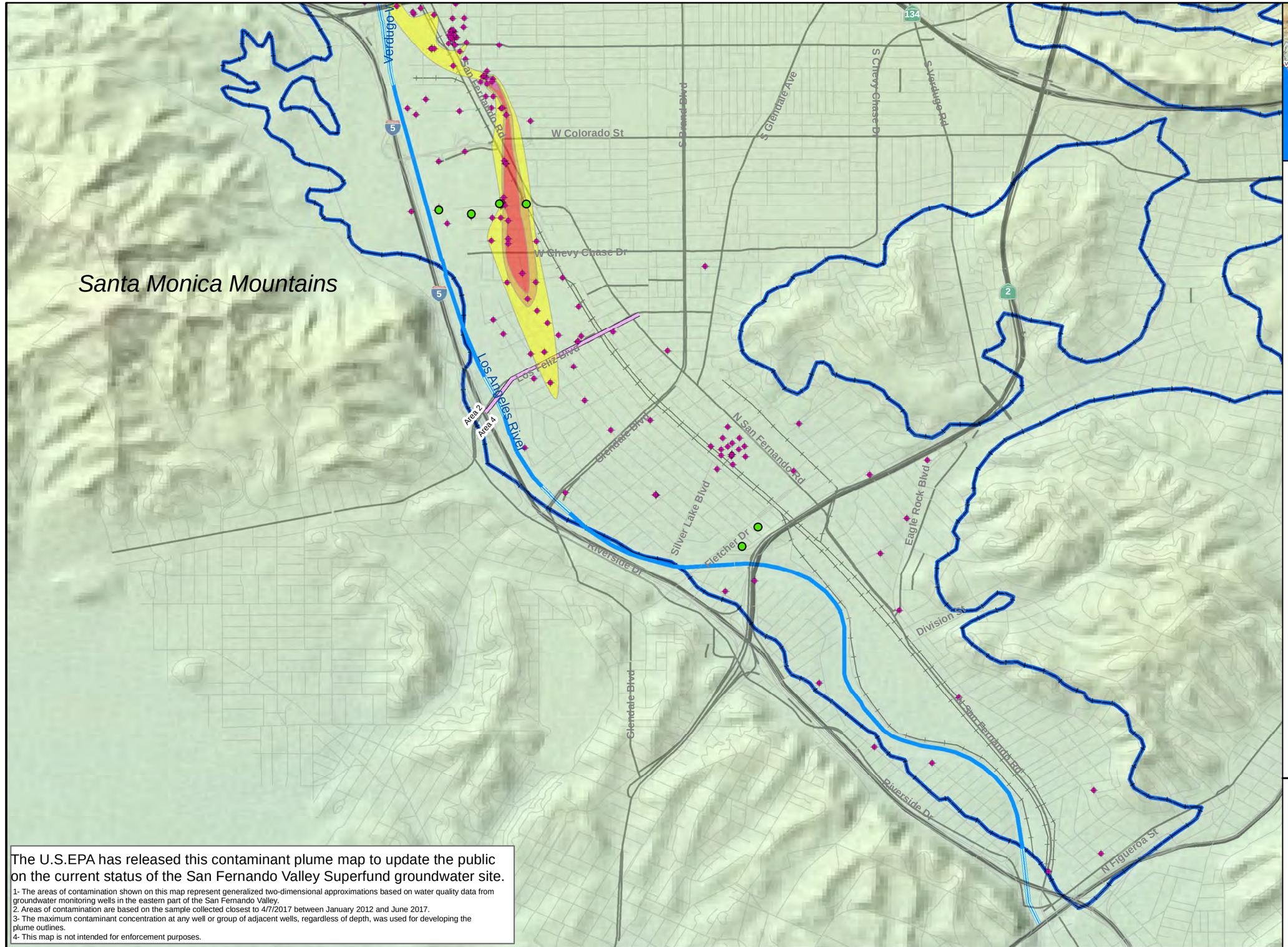

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

Cr6 Concentration

All contours approximate

- >1000 µg/L
- 100 - 999 µg/L
- 50 - 99 µg/L
- 10 - 49 µg/L

- Cr6 - Hexavalent Chromium
-OU - Operable Unit
-µg/L - micrograms per liter
-Hexavalent Chromium currently does not have a maximum contaminant level (MCL). The former MCL was 10 µg/L.
-The MCL for Total Chromium is 50 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

Hexavalent Chromium Contamination in Groundwater Area 4

San Fernando Valley Superfund Site

OTIE

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4- This map is not intended for enforcement purposes.

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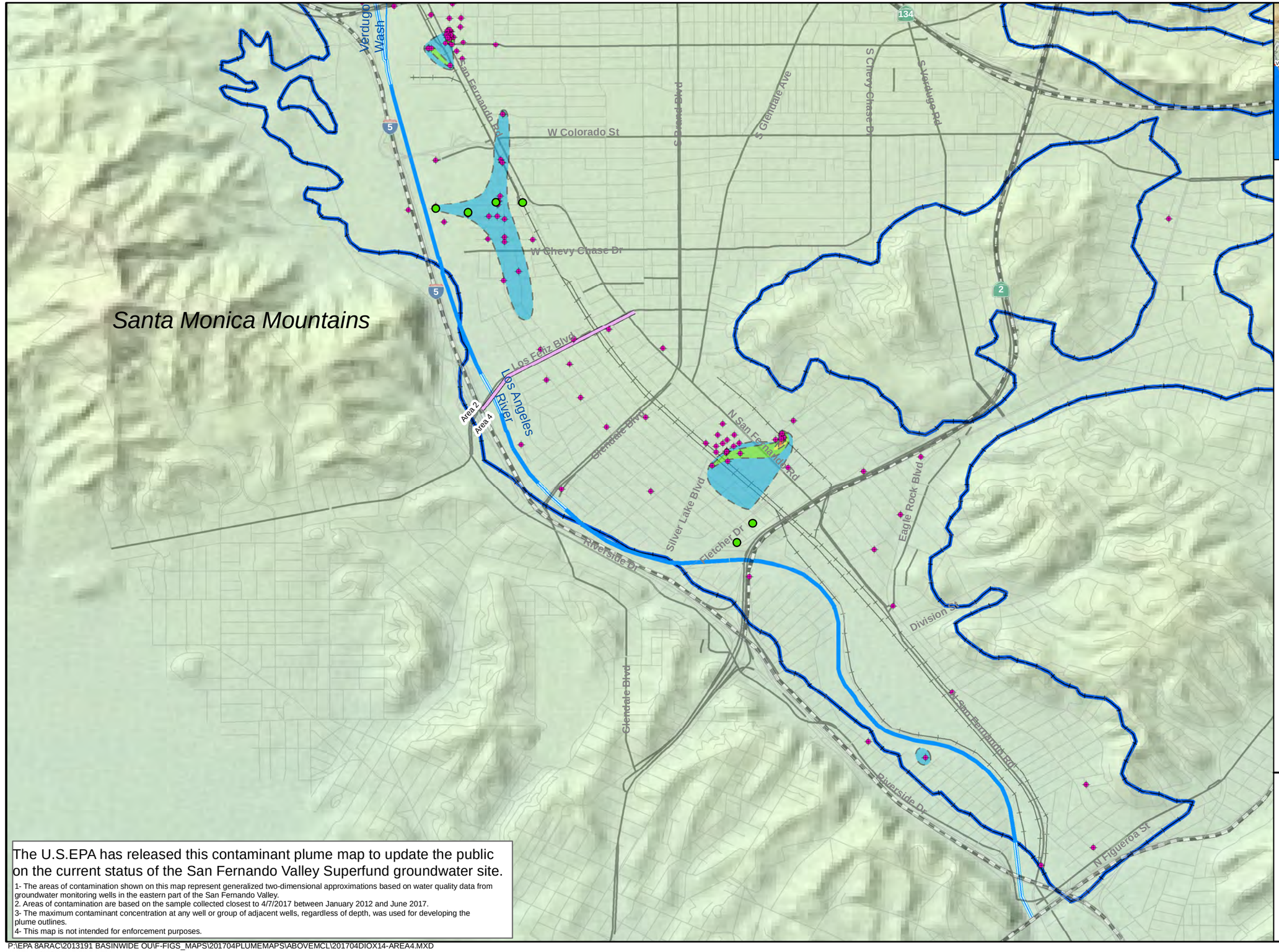

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

1,4-Dioxane Concentration

All contours approximate

- >100 µg/L
- 50 - 99 µg/L
- 10 - 49 µg/L
- 3 - 9.9 µg/L
- 1 - 2.9 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-The Notification Level for 1,4-Dioxane is 1 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

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1,4-Dioxane Contamination in Groundwater Area 4

San Fernando Valley Superfund Site

OTIE

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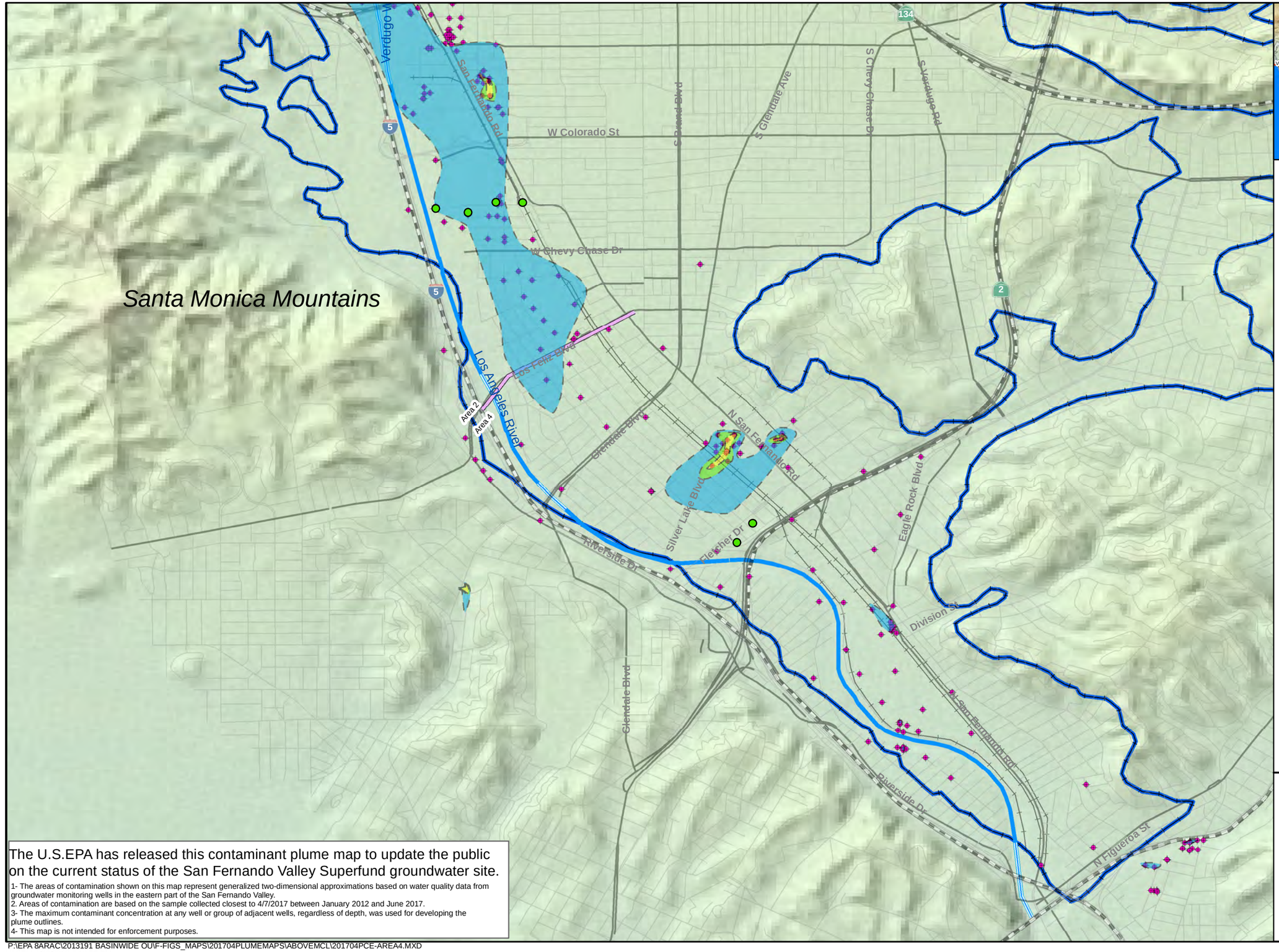

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

PCE Concentration

All contours approximate

- >1000 µg/L
- 500-999 µg/L
- 100-499 µg/L
- 50-99 µg/L
- 5-49 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-PCE - Tetrachloroethene
-The Maximum Contaminant Level (MCL) for PCE is 5 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

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Tetrachloroethene (PCE) Contamination in Groundwater Area 4

San Fernando Valley Superfund Site

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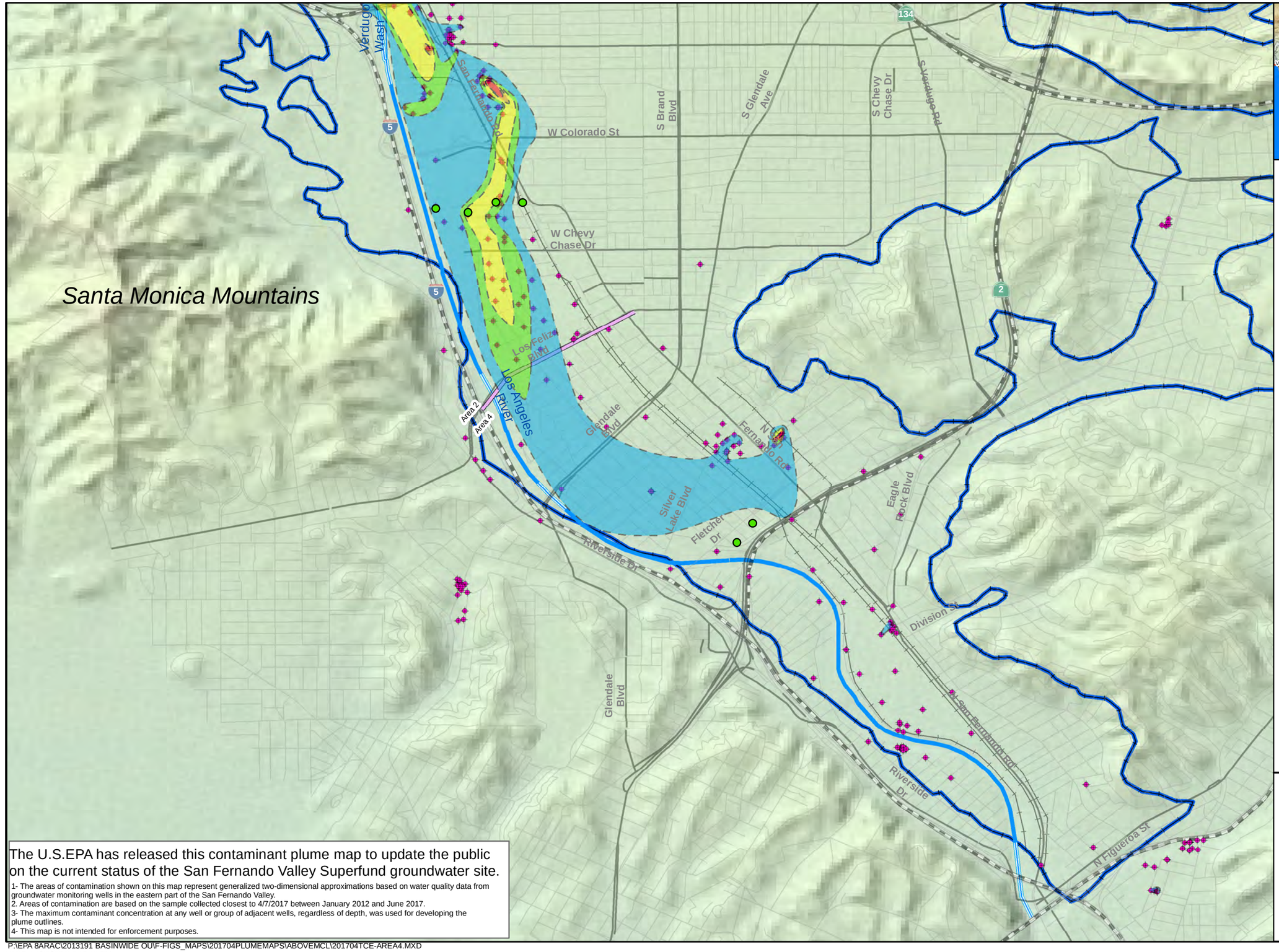

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

TCE concentration

All contours approximate

- >1000 µg/L
- 500-999 µg/L
- 100-499 µg/L
- 50-99 µg/L
- 5-49 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-TCE - Trichloroethene
-The Maximum Contaminant Level (MCL) for TCE is 5 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

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Trichloroethene (TCE) Contamination in Groundwater Area 4

San Fernando Valley Superfund Site

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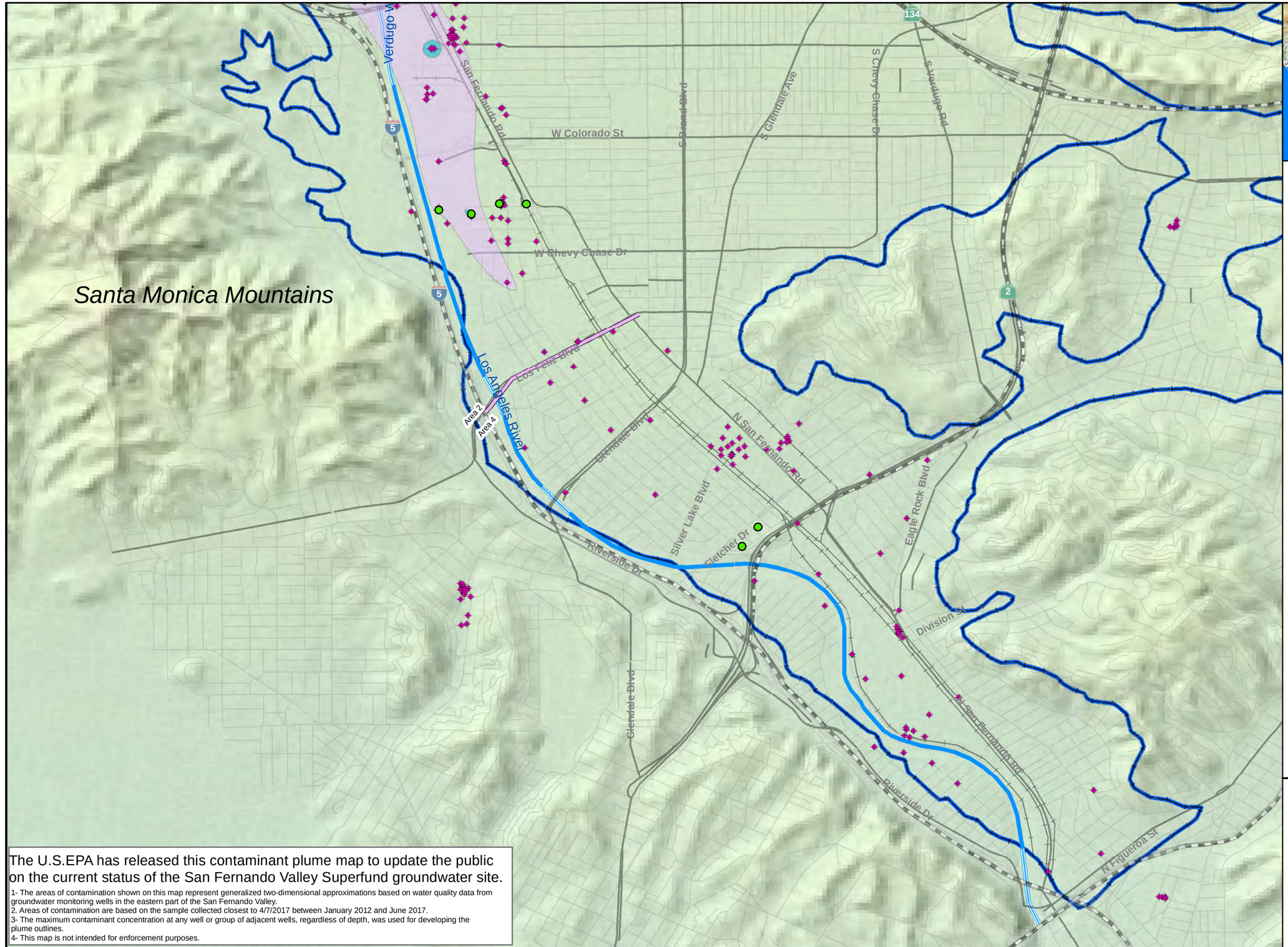

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

1,2,3-TCP Concentration

All contours approximate

- >50 - 99 µg/L
- 5 - 50 µg/L
- 0.5 - 5 µg/L
- 0.05 - 0.49 µg/L
- 0.005 - 0.049 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
1,2,3-TCP - 1,2,3-Trichloropropane
-The Maximum Contaminant Level (MCL) for 1,2,3-TCP is 0.005 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

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1,2,3-Trichloropropane Contamination in Groundwater Area 4

San Fernando Valley Superfund Site

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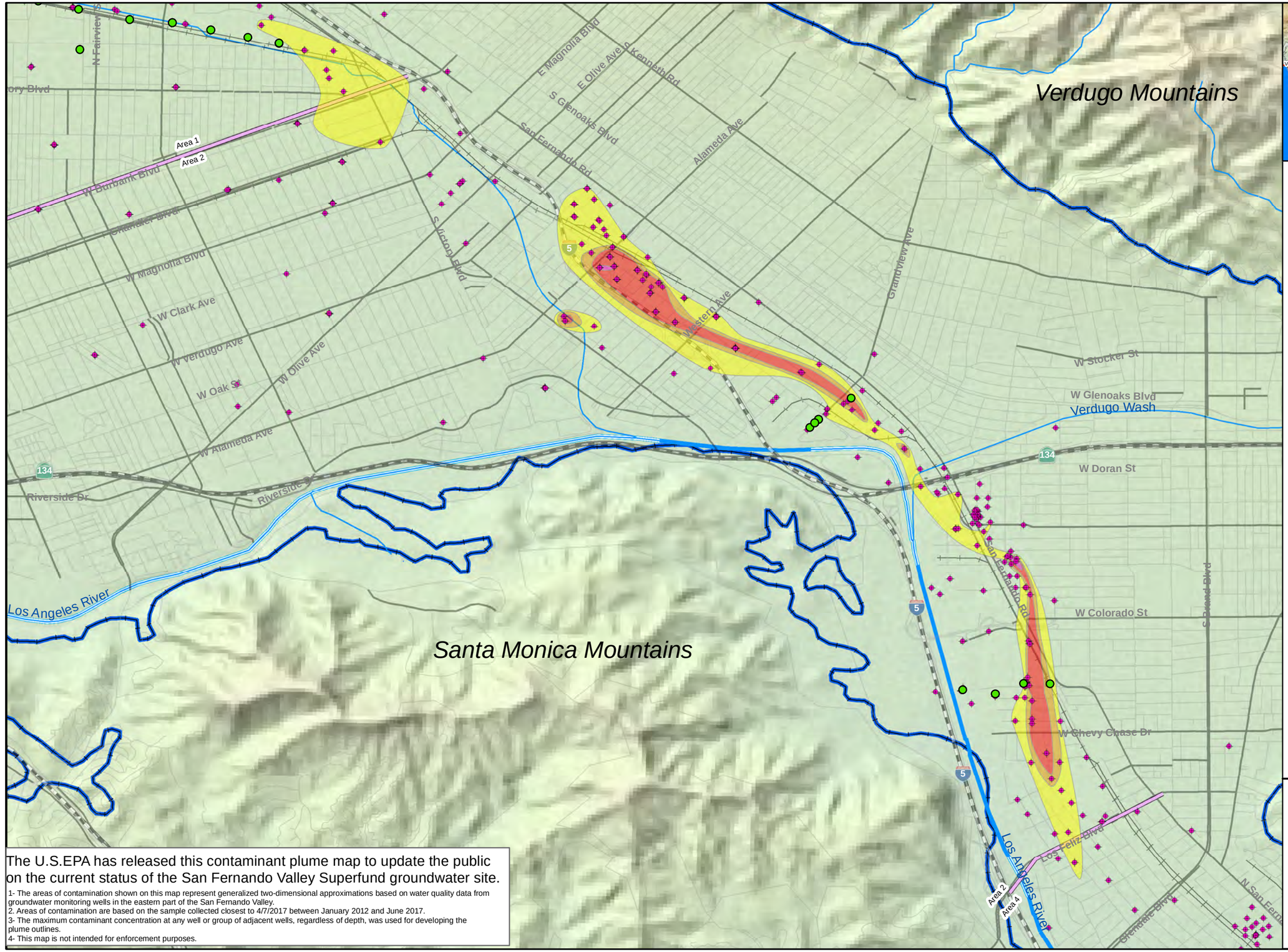

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

Cr6 Concentration

All contours approximate

- >1000 µg/L
- 100 - 999 µg/L
- 50 - 99 µg/L
- 10 - 49 µg/L

- Cr6 - Hexavalent Chromium
-OU - Operable Unit
-µg/L - micrograms per liter
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-The MCL for Total Chromium is 50 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

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Hexavalent Chromium Contamination in Groundwater Area 2

San Fernando Valley Superfund Site

OTIE

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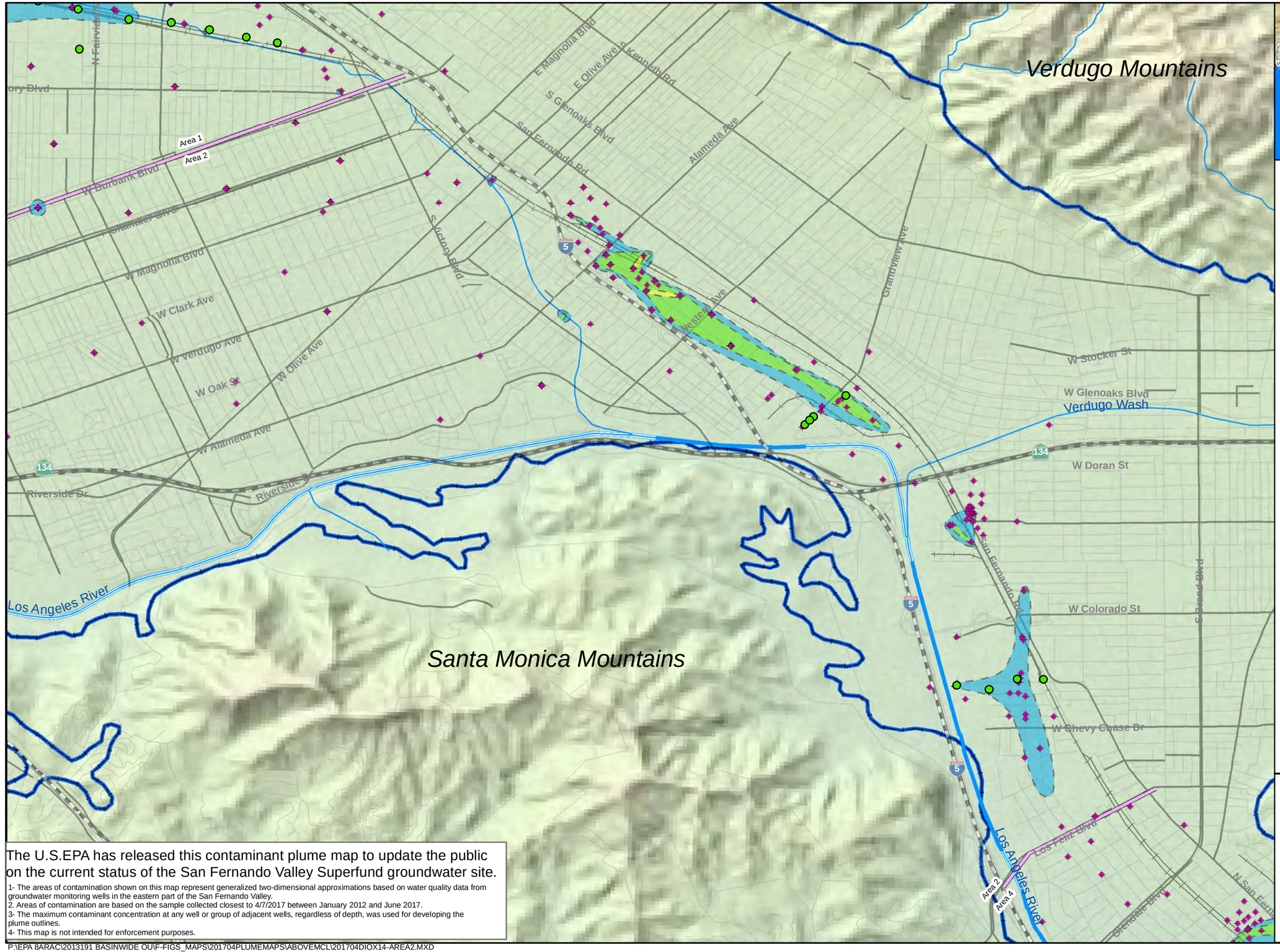

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

1,4-Dioxane Concentration

All contours approximate

- >100 µg/L
- 50 - 99 µg/L
- 10 - 49 µg/L
- 3 - 9.9 µg/L
- 1 - 2.9 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-The Notification Level for 1,4-Dioxane is 1 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

1,4-Dioxane Contamination in Groundwater Area 2

San Fernando Valley Superfund Site

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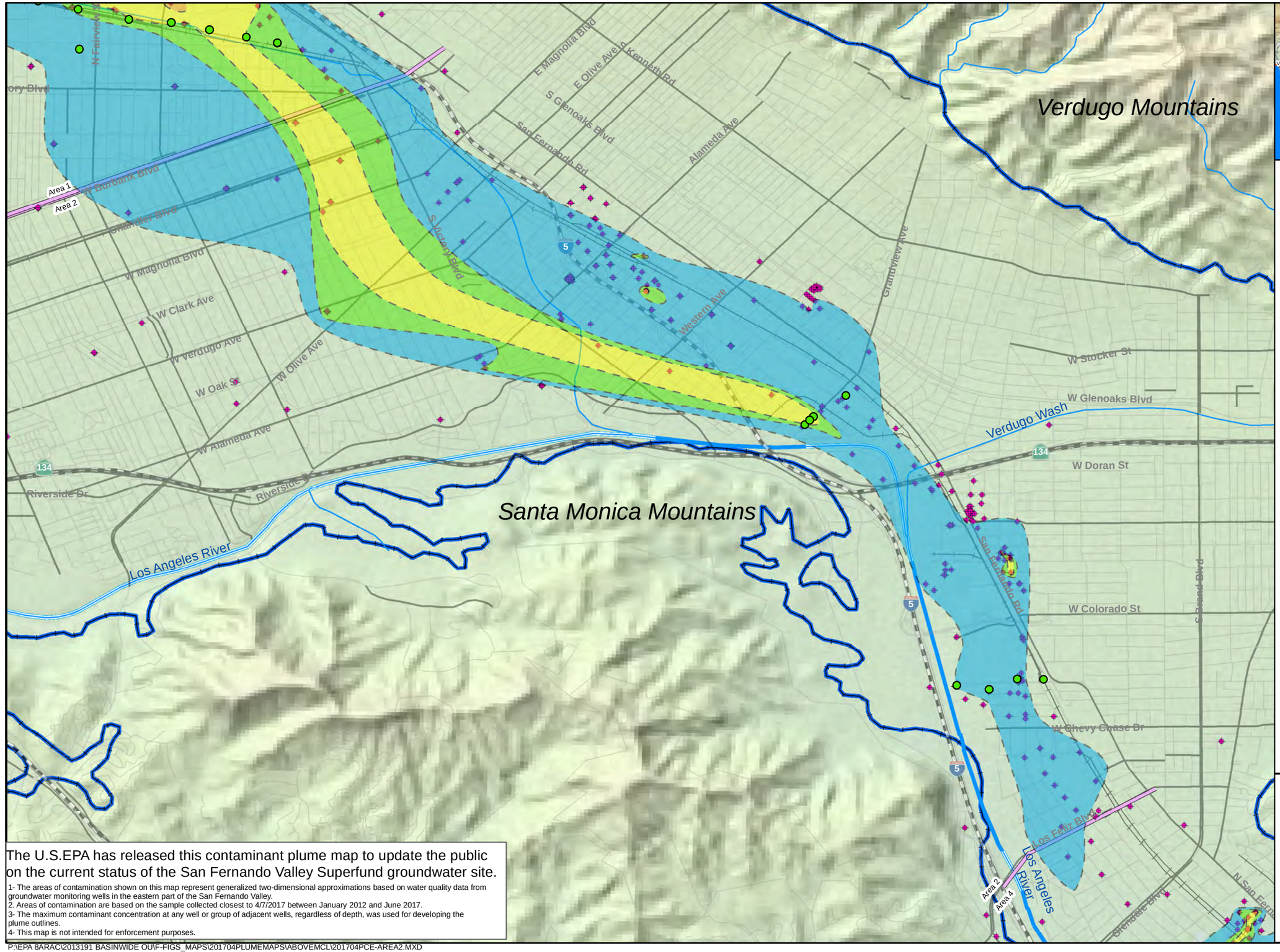

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

PCE Concentration

All contours approximate

- >1000 µg/L
- 500-999 µg/L
- 100-499 µg/L
- 50-99 µg/L
- 5-49 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-PCE - Tetrachloroethene
-The Maximum Contaminant Level (MCL) for PCE is 5 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

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Tetrachloroethene (PCE) Contamination in Groundwater Area 2

San Fernando Valley Superfund Site

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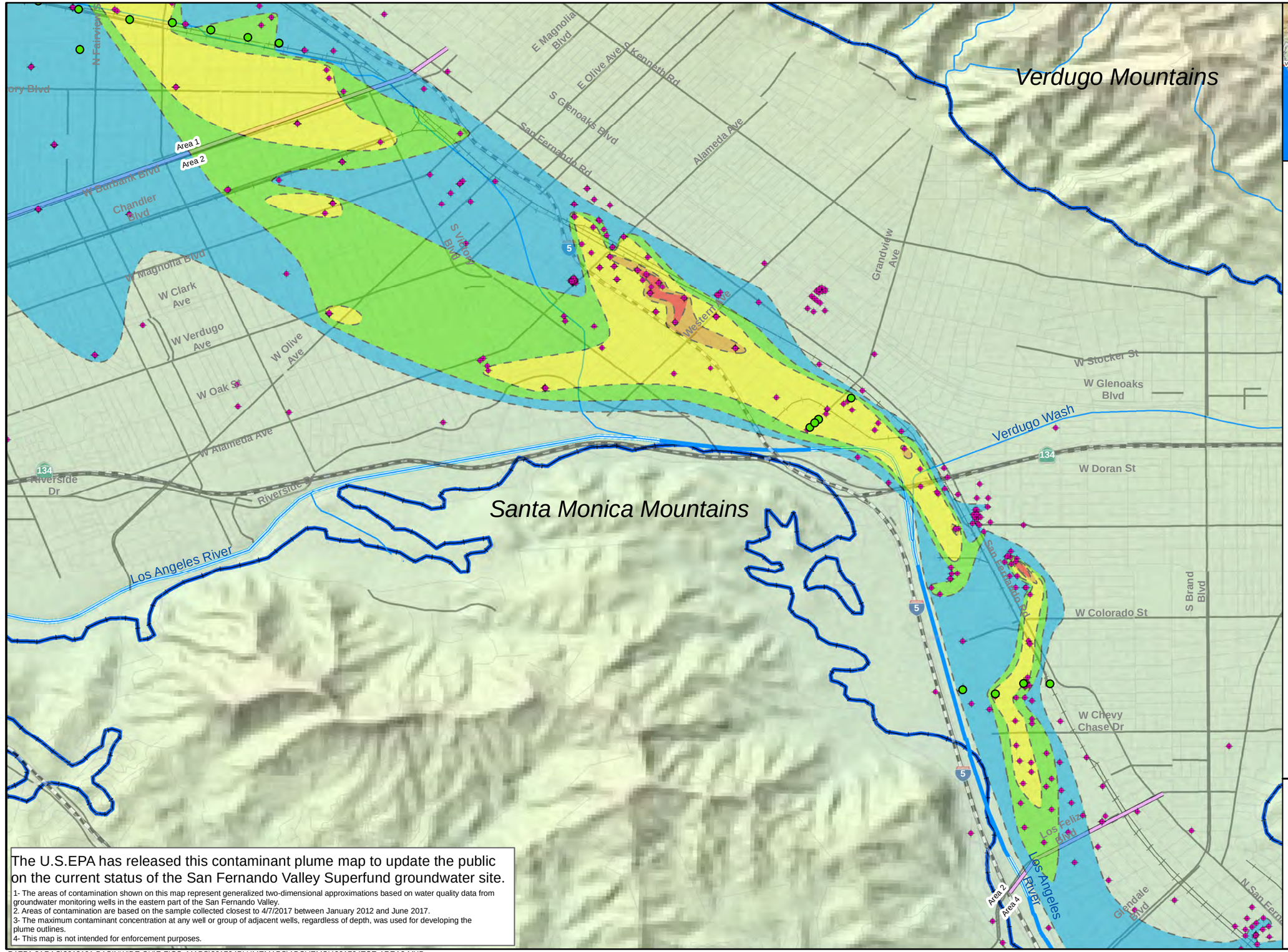

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

TCE concentration

All contours approximate

- >1000 µg/L
- 500-999 µg/L
- 100-499 µg/L
- 50-99 µg/L
- 5-49 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-TCE - Trichloroethene
-The Maximum Contaminant Level (MCL) for TCE is 5 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

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Trichloroethene (TCE) Contamination in Groundwater Area 2

San Fernando Valley Superfund Site

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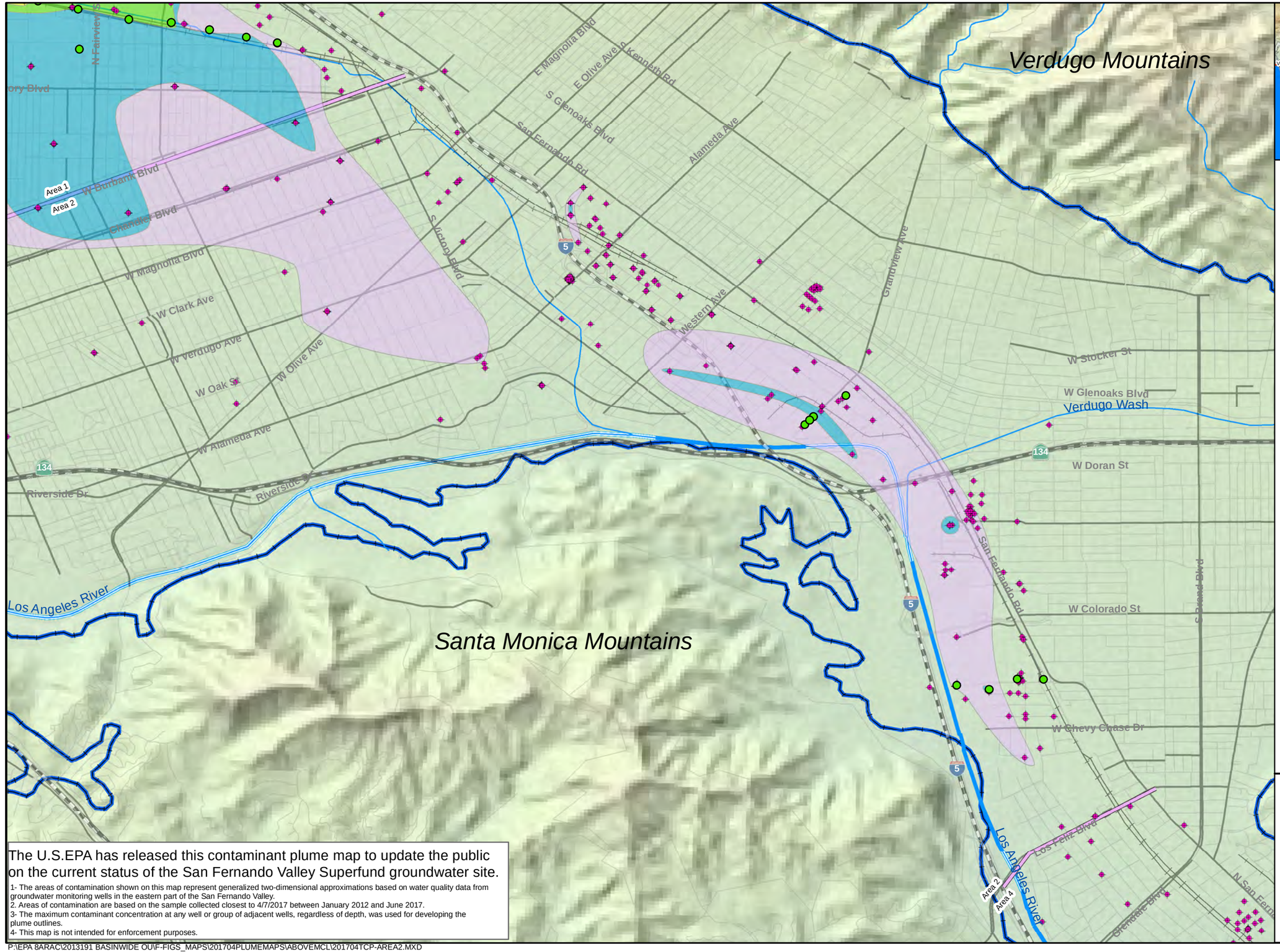

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

1,2,3-TCP Concentration

All contours approximate

- >50 - 99 µg/L
- 5 - 50 µg/L
- 0.5 - 5 µg/L
- 0.05 - 0.49 µg/L
- 0.005 - 0.049 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
1,2,3-TCP - 1,2,3-Trichloropropane
-The Maximum Contaminant Level (MCL) for 1,2,3-TCP is 0.005 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

The U.S.EPA has released this contaminant plume map to update the public on the current status of the San Fernando Valley Superfund groundwater site.

1- The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality data from groundwater monitoring wells in the eastern part of the San Fernando Valley.
2. Areas of contamination are based on the sample collected closest to 4/7/2017 between January 2012 and June 2017.
3- The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for developing the plume outlines.
4- This map is not intended for enforcement purposes.

1,2,3-Trichloropropane Contamination in Groundwater Area 2

San Fernando Valley Superfund Site

OTIE

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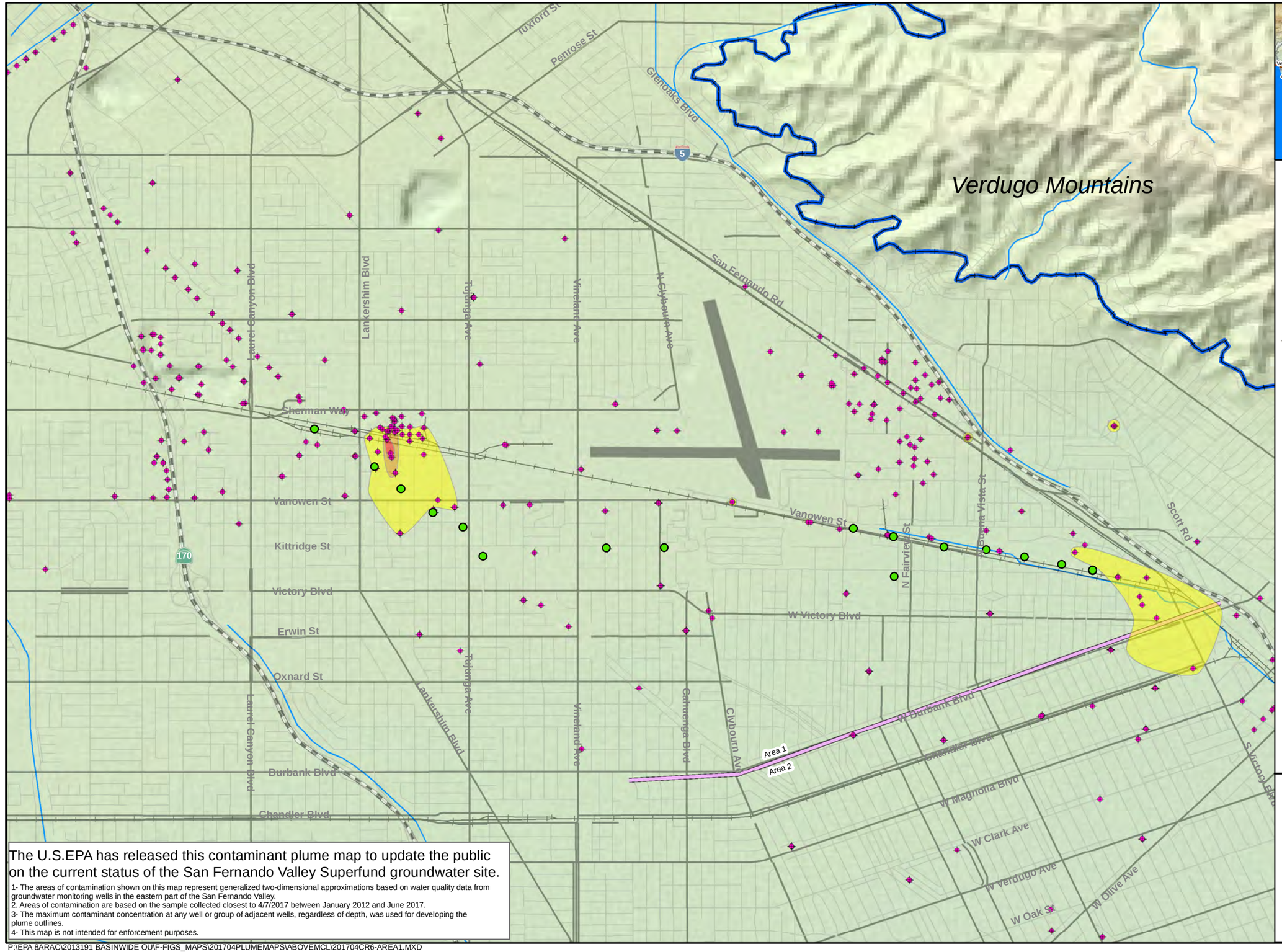

Legend

- Groundwater Well
- OU Extraction Wells
- Superfund Site Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

Cr6 Concentration

All contours approximate

- >1000 µg/L
- 100 - 999 µg/L
- 50 - 99 µg/L
- 10 - 49 µg/L

- Cr6 - Hexavalent Chromium
-OU - Operable Unit
-µg/L - micrograms per liter
-Hexavalent Chromium currently does not have a maximum contaminant level (MCL) The former MCL was 10 µg/L.
-The MCL for Total Chromium is 50 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

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Hexavalent Chromium Contamination in Groundwater Area 1

San Fernando Valley Superfund Site

OTIE

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Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

1,4-Dioxane Concentration

All contours approximate

- >100 µg/L
- 50 - 99 µg/L
- 10 - 49 µg/L
- 3 - 9.9 µg/L
- 1 - 2.9 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-The Notification Level for 1,4-Dioxane is 1 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

1,4-Dioxane Contamination in Groundwater Area 1

San Fernando Valley Superfund Site

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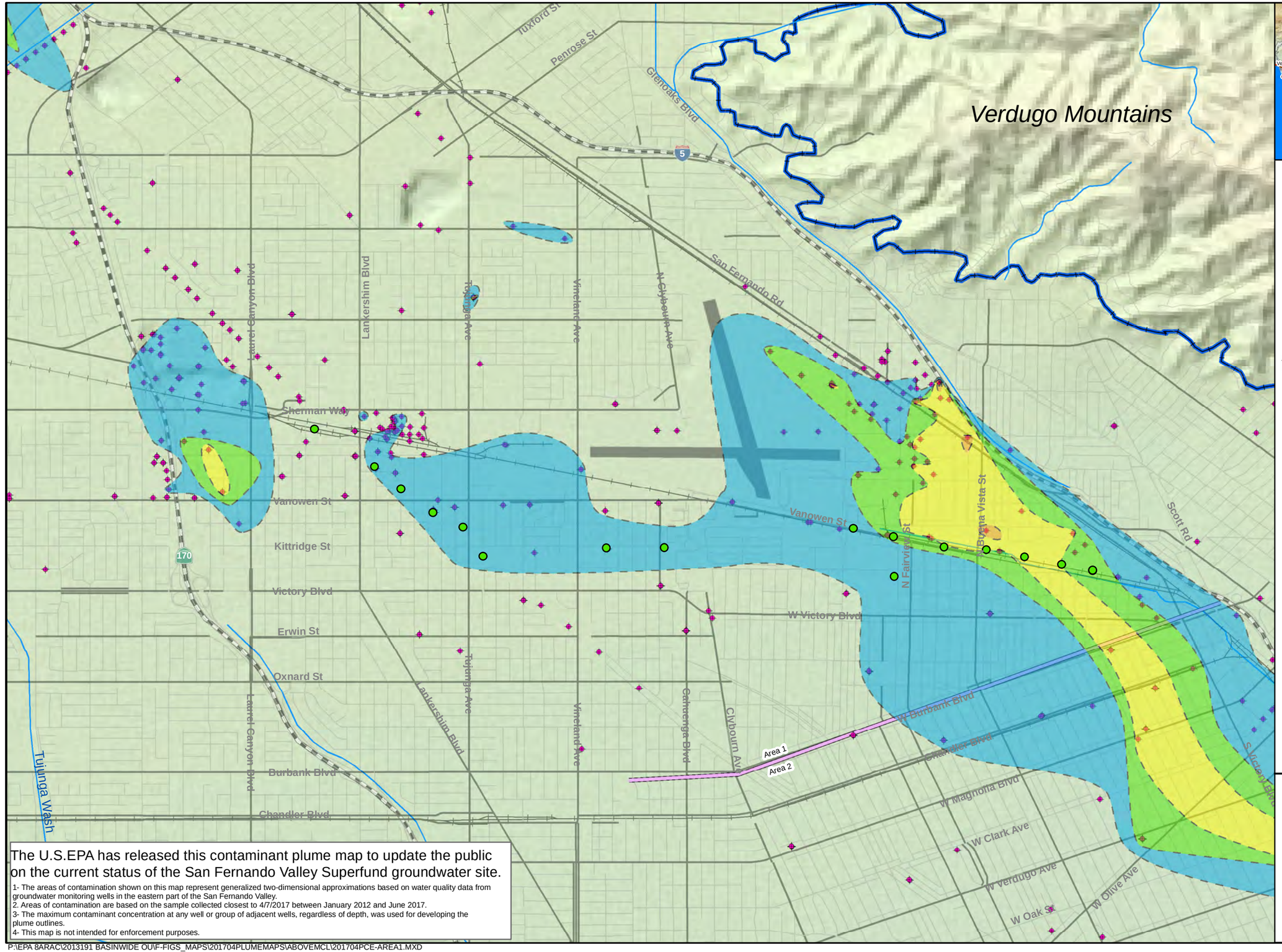

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Railroads
- Streams
- Freeways
- Streams
- Groundwater Basin Boundary

PCE Concentration

All contours approximate

- >1000 µg/L
- 500-999 µg/L
- 100-499 µg/L
- 50-99 µg/L
- 5-49 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-PCE - Tetrachloroethene
-The Maximum Contaminant Level (MCL) for PCE is 5 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

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Tetrachloroethene (PCE) Contamination in Groundwater Area 1

San Fernando Valley Superfund Site

OTIE

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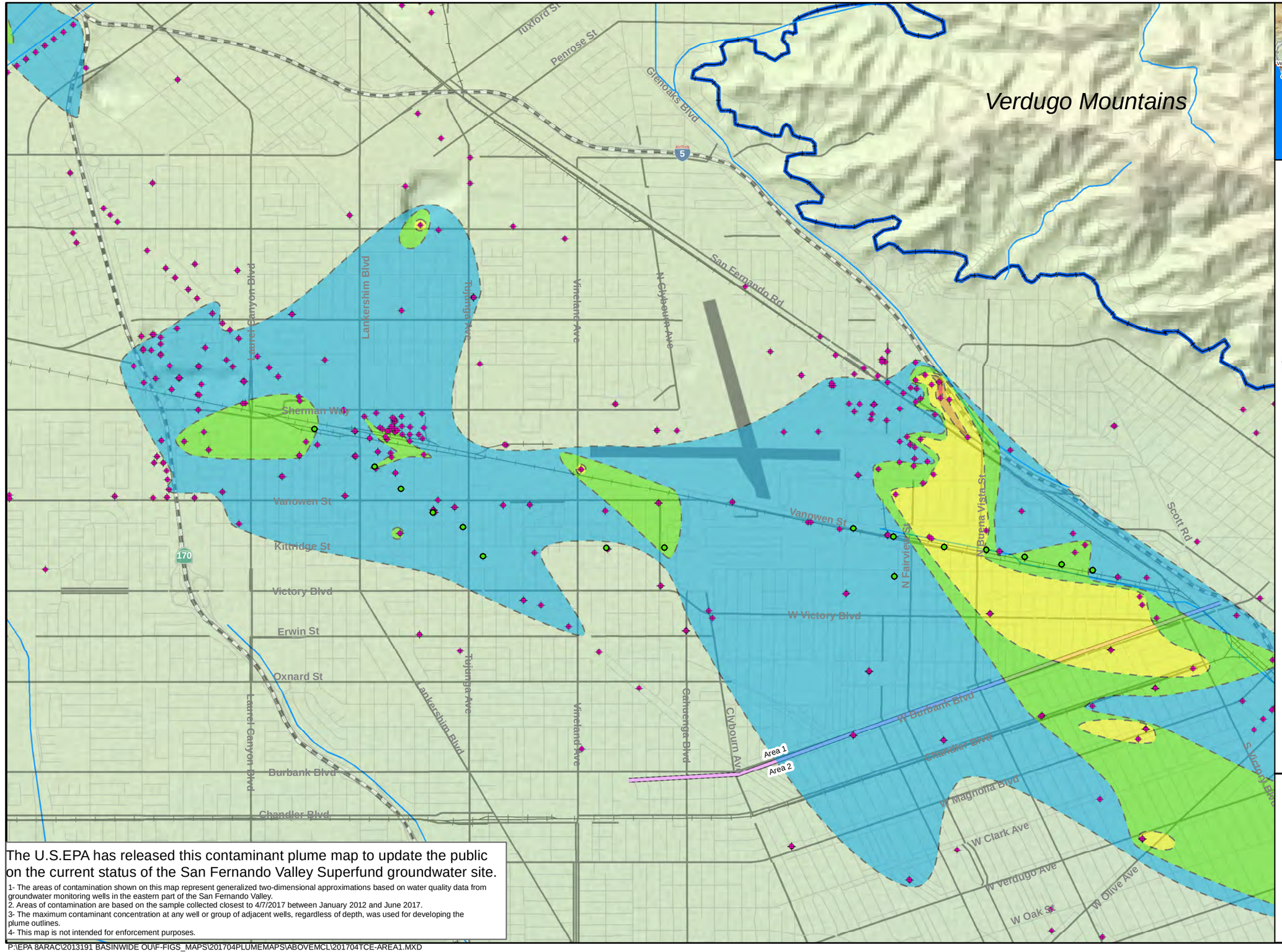

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

TCE concentration

All contours approximate

- >1000 µg/L
- 500-999 µg/L
- 100-499 µg/L
- 50-99 µg/L
- 5-49 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
-TCE - Trichloroethene
-The Maximum Contaminant Level (MCL) for TCE is 5 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

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Trichloroethene (TCE) Contamination in Groundwater Area 1

San Fernando Valley Superfund Site

OTIE

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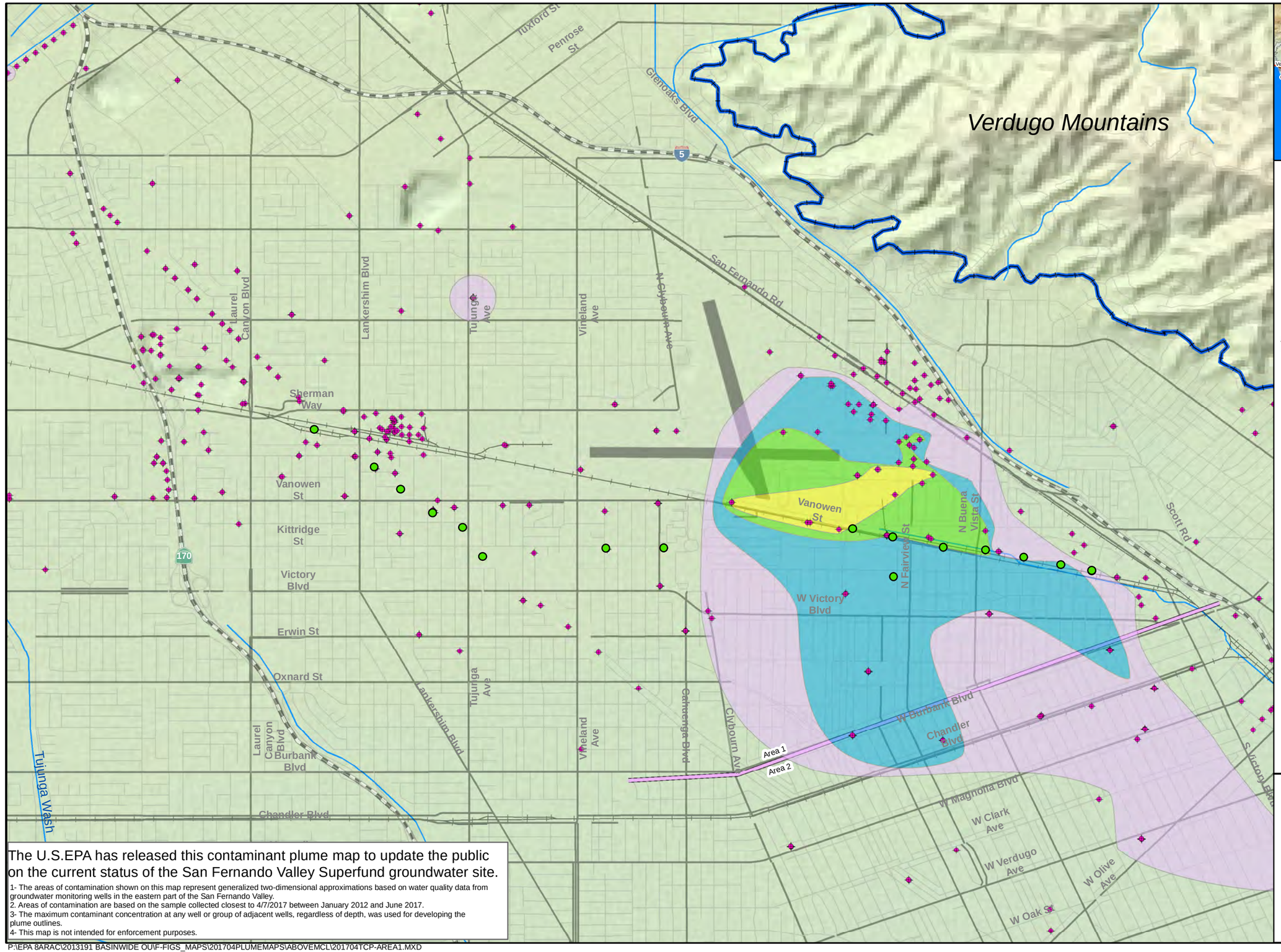

Legend

- Groundwater Well
- OU Extraction Wells
- Area Boundaries
- Roads
- Freeways
- Railroads
- Streams
- Groundwater Basin Boundary

1,2,3-TCP Concentration

All contours approximate

- >50 - 99 µg/L
- 5 - 50 µg/L
- 0.5 - 5 µg/L
- 0.05 - 0.49 µg/L
- 0.005 - 0.049 µg/L

-OU - Operable Unit
-µg/L - micrograms per liter
1,2,3-TCP - 1,2,3-Trichloropropane
-The Maximum Contaminant Level (MCL) for 1,2,3-TCP is 0.005 µg/L.
-Concentration from the sample collected closest to 7 April 2017 and between January 2012 and August 2017.

N

0 0.25 0.5 1 Miles

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1,2,3-Trichloropropane Contamination in Groundwater Area 1

San Fernando Valley Superfund Site

OTIE

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Appendix F

Summary of Distributed Stormwater Capture Projects

APPENDIX F - Summary of Distributed Stormwater Capture Projects

(acre-feet)

Agency	Spreading Facility	WY 2017-18 OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
City of Los Angeles [1]														
	Distributed Green Stormwater Infrastructure in SFB	0.00	0.00	0.00	120.00	3.00	193.00	0.00	0.00	0.00	0.00	0.00	0.00	**316.00**
City of Glendale														
	Harvard Green Street Demonstration Project	0.01	0.00	0.00	0.15	0.01	0.24	0.00	0.01	0.00	0.00	0.00	0.00	**0.41**

1. Distributed facilities spreading figures only account for single-day storm events exceeding 0.1" of rainfall. Values are based on flow telemetry software available at each facility. Figures are reported by LADWP and are modeled estimates based on amount of precipitation and the specific project hydrology.